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February 14, 2012

VIA ELECTRONIC FILING

Dr. Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
350 Metro Square Building
121 Seventh Place East
St. Paul, MN 55101

Re: Application to the Public Utilities Commission for a Route Permit for the 0844 and 0861 Transmission Line Rebuild Project in Burnsville, MN
Docket No. E002/TL-11-795

Dear Dr. Haar:

Northern States Power Company, a Minnesota corporation ("Xcel Energy" or the "Company"), is electronically filing its application for a route permit for the 0844 and 0861 Transmission Line Rebuild Project in Burnsville, Minnesota ("Project") pursuant to the alternative permitting procedures in Minnesota Rules 7850.2800 to 7850.3900.

The proposed Project includes the construction of two 115 kV transmission lines approximately 4.2 miles long on double circuit structures on new right-of-way, construction of approximately 0.4 miles of single circuit 115 kV transmission line facilities to connect Transmission Line 0844 and Transmission Line 0861 to the Black Dog Substation, and removal of approximately 3.8 miles of two parallel, existing, 115 kV transmission lines and structures. The Project is entirely within the City of Burnsville, Dakota County, Minnesota.

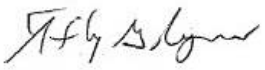
Transmission Line 0844 and Transmission Line 0861 are more than 50 years old and have wood poles. The Company has determined that both lines need to be rebuilt due to their deteriorating condition. In addition, a rebuild of Transmission Line 0844 is required to meet North American Electric Reliability Corporation mandatory reliability standards. Transmission Line 0844 overloads if the circuit breaker at the Wilson Substation has an internal fault. The proposed Project will rebuild both lines to a higher capacity, thereby preventing overloading in the event of a Wilson Substation breaker fault.

This filing consists of the body of the Application and associated appendices, 4 files in total, as follows:

Cover Letter and Application—1 file
Appendix A—1 file
Appendix B—1 file
Appendix C – Appendix F—1 file

The initial application fee payment and copies of the Application are being sent to the Department of Commerce under separate cover. Please call me at 612.330.1955 if you have any questions.

Sincerely,



Timothy G. Rogers
Supervisor, Siting and Permitting

Enclosure
cc: Raymond Kirsch, Department of Commerce
Project Service List

4472758v2

NORTHERN STATES POWER COMPANY

APPLICATION TO THE

MINNESOTA PUBLIC UTILITIES COMMISSION

FOR A ROUTE PERMIT

REBUILD OF TRANSMISSION LINES 0844 AND 0861 PROJECT

Alternative Permitting Process

MPUC Docket No. E002/TL-11-795

February 14, 2012

Prepared by Northern States Power Company

Xcel Energy®

Application for a Route Permit

Rebuild of Transmission Lines 0844 and 0861 Project

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1.0 INTRODUCTION

1.1 Proposal Summary

Northern States Power Company, a Minnesota corporation ("Xcel Energy" or the "Company"), submits this application ("Application") for a Route Permit to the Minnesota Public Utilities Commission ("MPUC" or "Commission") pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850.

Xcel Energy requests a route permit to rebuild a portion of its 115 kilovolt ("kV") transmission system between its Black Dog Substation in Burnsville and its Savage Substation in Savage, Minnesota. The project, referred to as the Rebuild of Transmission Lines 0844 and 0861 Project ("Project"), is located entirely within the City of Burnsville ("City"), Dakota County, and is comprised of:

- Construction of two 115 kV transmission lines approximately 4.2 miles long on double circuit structures on new right-of-way;
- Construction of approximately 0.4 mile of single circuit 115 kV transmission line facilities to connect Transmission Line 0844 (750 feet) and Transmission Line 0861 (1,225 feet) to Black Dog Substation; and
- Removal of approximately 3.8 miles of two parallel existing 115 kV transmission lines (0844 and 0861) and structures.

The Project, as proposed, is designed to move existing 115 kV transmission line facilities from the center of Black Dog Lake to the northwestern edge of the lake, to consolidate two 115 kV transmission lines on single poles for the majority of their length, and to relocate 115 kV lines out of a limestone quarry planned for future development.

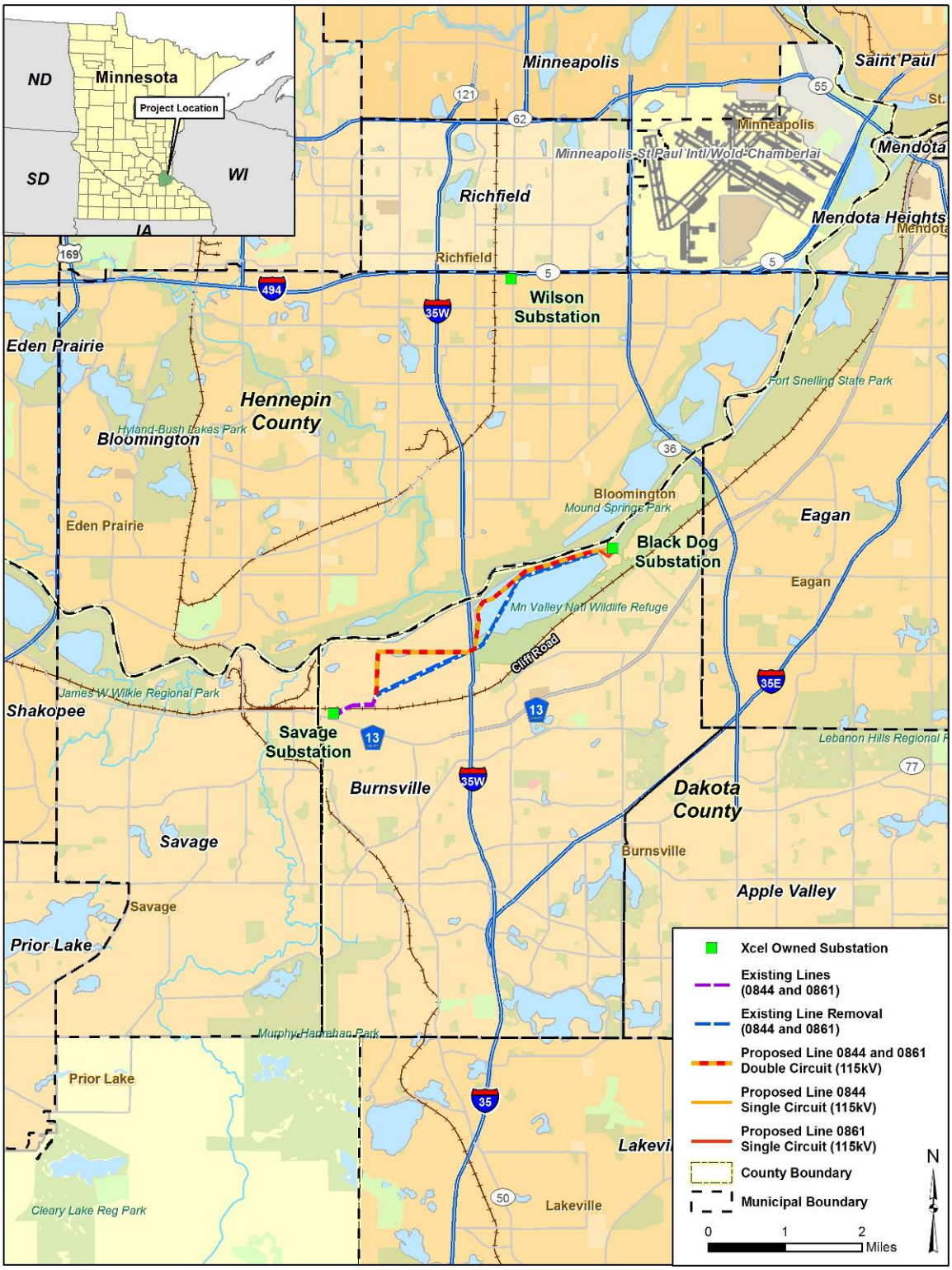
1.2 Project Area

The west and east ends of the proposed Project are separated by Interstate 35 West ("I-35W"). The western portion of the Project area is dominated by the Kraemer Mining and Materials' limestone quarry operation (the "Quarry"). The eastern portion of the Project area consists predominantly of Black Dog Generating Plant (the "Plant") land owned by Xcel Energy.

The Plant property covers about 1,900 acres south of the Minnesota River in Burnsville. The total acreage includes the Plant site covering about 80 acres, which entails the powerhouse, coal yard, substation, settling ponds, and Black Dog Lake (used for cooling) covering about 500 acres. The majority of the remaining property (1,250 acres) is managed as part of the Minnesota Valley National Wildlife Refuge ("Minnesota Valley NWR") under a 1982 lease and agreement with the U.S. Fish and Wildlife Service ("USFWS"). Established in 1976, the Minnesota Valley NWR stretches over 50 miles between Fort Snelling State Park and Belle Plaine, Minnesota, and provides habitat for a large number of migratory waterfowl, fish, and other wildlife species (USFWS, 2010).

The general Project location is shown below on **Figure 1**.

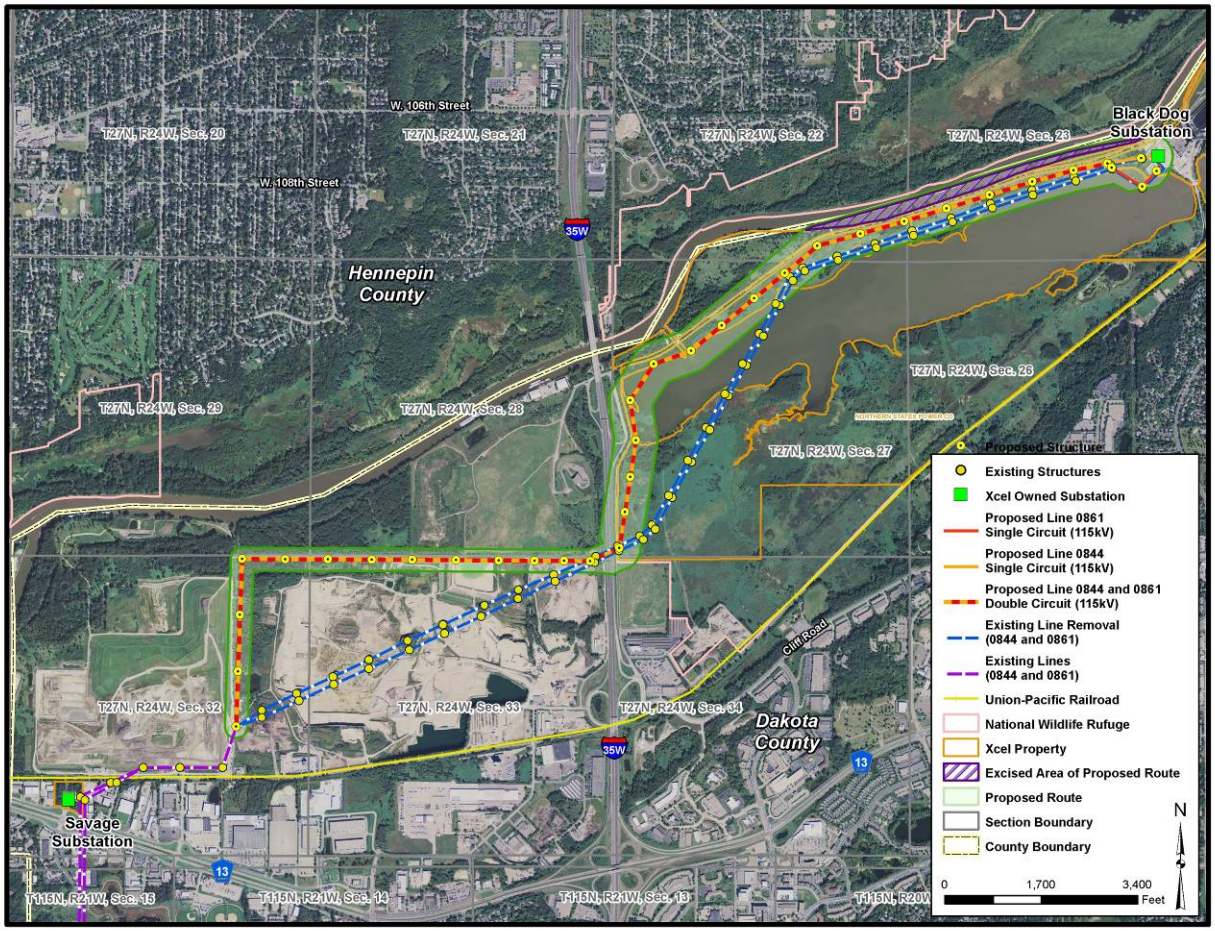
Figure 1 – Project Location



The Project structures are proposed to be 50 to 100 feet tall, depending on final design, with spans of 500 to 800 feet. The right-of-way is proposed to be 100 feet wide. The Project is scheduled to be in service in Second Quarter 2013 and is estimated to cost approximately $8.69 million.

The proposed Project is described in more detail throughout this Application. In this Application, Company has analyzed and presented data for a 400- wide route width to the west side of I-35 W and a 750-foot route from that point to the east side The route width is requested for flexibility to adjust the route based on site specific engineering and design, particularly on the east side of I-35 W. The Company respectfully requests that the Commission approve a route with 400- and 750-foot width which excludes the Minnesota river as shown on **Figure 2** ("Proposed Route"). The Proposed Route crosses Xcel Energy-owned land for 40 percent of its length.

Figure 2 – Proposed Route



1.3 Project Need

Transmission Line 0844 and Transmission Line 0861 are more than 50 years old and have wood poles. The Company has determined that both lines need to be rebuilt due to their deteriorating

condition. In addition, a rebuild of Transmission Line 0844 is required to meet North American Electric Reliability Corporation ("NERC") mandatory reliability standards. Transmission Line 0844 overloads if the circuit breaker at the Wilson Substation has an internal fault. The proposed Project will rebuild both lines to a higher capacity, thereby preventing overloading in the event of a Wilson Substation breaker fault.

1.4 Routing Considerations

Once engineers identified the electrical need for rebuilding Transmission Line 0844 (built in 1955) and Transmission Line 0861 (built in 1962), the Company evaluated routes based on the need to find a permanent location and the opportunity to reduce impacts to Black Dog Lake.

On the west end of the Project, the Company noted the planned future use for the Quarry property would conflict with the existing transmission lines. The poles of the existing transmission lines sit atop 80-foot formations of limestone, which are the result of years of mining around the structures. The City's future plans for this area are for Kraemer to close the Quarry, remove the transmission facilities and flood the property to create a 350-plus acre lake. *See* Burnsville Comprehensive Plan Update 2030, Chapter VI (June 22, 2010, http://www.ci.burnsville.mn.us/index.aspx?NID=434). Consequently, when reviewing potential routes, the Company determined rebuilding on the existing alignment was not a reasonable alternative because the new lines would need to be relocated when the Quarry is flooded. As a result, on the west end, the Company proposes a route on the north side of the Quarry.

The Company also evaluated an alternative for modifying alignments of Transmission Lines 0844 and 0861 on the east end of the Project. The two lines, which currently traverse the middle of Black Dog Lake, are proposed to be consolidated and relocated to the northern western edge of the lake, thereby reducing the length of conductors crossing over the water.

1.5 Permitting Process

The Project consists of 115 kV facilities that do not cross state lines and therefore qualifies for the Alternative Permitting Process under Minnesota Statutes Section 216E.04, subdivision 2(3), and Minnesota Rules Chapter 7850.2800 to 7850.3900 (*see* Minn. R. 7850.2800, Subp. 1(C)).

1.6 Completeness Checklist

The content requirements for an application with the Commission under the Alternative Permitting Process are identified under Minnesota Statutes Section 216E.04, subdivision 2(3) and Minnesota Rules 7850.2900 and 7850.1700. **Table 1** lists the rule requirements and the section where the information can be found in this Application.

Table 1 – Completeness Checklist

Authority	Required Information	Section
Minn. R. 7850.2800 Subp. 1(C) – Eligible Projects		
	An applicant for a site permit or a route permit for one of the following projects may elect to follow the procedures of parts 7850.2800 to 7850.3900 instead of the full permitting procedures in part 7850.1700 to 7850.2700 for high voltage transmission lines of between 100 and 200 kilovolts.	2.5
Minn. R. 7850.2800, Subp. 2 – Notice to Commission		
	An applicant for a permit for one of the qualifying projects in subpart 1, who intends to follow the procedures of parts 7850.2800 to 7850.3700, shall notify the MPUC of such intent, in writing, at least 10 days before submitting an application for the project.	2.7; Appendix A
Minn. R. 7850.3100 Contents of Application (alternative permitting process)		
	The applicant shall include in the application the same information required in part 7850.1900, except the applicant need not propose any alternative sites or routes to the preferred site or route. If the applicant has rejected alternative sites or routes, the applicant shall include in the application the identity of the rejected sites or routes and an explanation of the reasons for rejecting them.	4.4
Minn. R. 7850.1900, Subp. 2 (applicable per Minn. R. 7850.3100) – Route Permit for a High Voltage Transmission Line ("HVTL")		
A.	A statement of proposed ownership of the facility at the time of filing the Application and after commercial operation.	2.1
B.	The precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the Route Permit may be transferred if transfer of the Route Permit is contemplated.	2.3
C.	At least two proposed routes for the proposed HVTL and identification of the preferred route and the reasons for the preference.	N/A per Minn. R. 7850.3100
D.	A description of the proposed HVTL and all associated facilities, including the size and type of the HVTL.	3.2, 4.1, 5.1.1
E.	The environmental information required under Minn. R. 7850.1900, Subp. 3.	6.0
F.	Identification of land uses and environmental conditions along the proposed routes.	6.0
G.	The names of each owner whose property is within any of the proposed routes for the HVTL.	5.1.3 Figure B-10
H.	U.S. Geological Survey ("USGS") topographical maps or other maps acceptable to the Commission showing the entire length of the HVTL on all proposed routes.	Figure B-1

Authority	Required Information	Section
I.	Identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share right-of-way with the proposed HVTL.	5.1.2, 5.1.3
J.	The engineering and operational design concepts for the proposed HVTL, including information on the electric and magnetic fields of the HVTL.	5.1, 5.2
K.	Cost analysis of each route, including the costs of constructing, operating and maintaining the HVTL that are dependent on design and route.	3.5; 4.4
L.	A description of possible design options to accommodate expansion of the HVTL in the future.	4.5
M.	The procedures and practices proposed for the acquisition and restoration of the right-of-way and for construction and maintenance of the HVTL.	5.1.3; 5.1.4
N.	A listing and brief description of federal, state and local permits that may be required for the proposed HVTL.	7.3
O.	A copy of the Certificate of Need or the certified HVTL list containing the proposed HVTL or documentation that an application for a Certificate of Need has been submitted or is not required.	2.4
Minn. R. 7850.1900, Subp. 3 – Environmental Information		
A.	A description of the environmental setting for each site or route.	6.1
B.	A description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation and public services.	6.2
C.	A description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism and mining.	6.3
D.	A description of the effects of the facility on archaeological and historic resources.	6.4
E.	A description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna.	6.5
F.	A description of the effects of the facility on rare and unique natural resources.	6.6
G.	Identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route.	4.3; 6.0
H.	A description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigation measures.	6.0

2.0 STATEMENT OF OWNERSHIP AND REGULATORY REQUIREMENTS

2.1 Statement of Ownership

Xcel Energy will construct, own, and operate the proposed new 115 kV double circuit transmission line between the Black Dog Substation and Structure 31A, just east of the Savage Substation located within Dakota County, Minnesota (*see* **Figure 2**).

Xcel Energy is Minnesota's largest electric utility based on generating capacity. The Company owns and operates a number of generation facilities including coal, oil, natural gas, hydro, refuse derived fuel, and the Monticello and Prairie Island nuclear power plants. Xcel Energy serves approximately 1.3 million electric customers in the state.

Xcel Energy Services Inc. is the service company for the Xcel Energy Inc. holding company and its personnel prepare, submit, and administer regulatory applications to the Commission on behalf of Xcel Energy, including Route Permit applications.

2.2 Requested Action

This Application is submitted under the Alternative Permitting Process under Minnesota Statutes Section 216E.04, subdivision 2(3) and Minnesota Rules 7850.2800 to 7850.3900 (*see* Minn. R. 7850.2800, Subp. 1(C)). While the rules do not require consideration of alternative routes in the Application (see Minn. R. 7850.3100), Xcel Energy's evaluation of an alternative route segment, in addition to the "Proposed Route" for the Project is contained in this Application. For the reasons presented herein, Xcel Energy prefers the Proposed Route for the new transmission line and respectfully requests that the Commission approve the Proposed Route with a 400-foot wide width on the west end to I-35W and a 750-foot-wide route width from the west side of I-35W to the east end of the Project (*see* **Figure B-1**).

This Application demonstrates that construction of the Project along the Proposed Route will comply with the applicable standards and criteria set out in Minnesota Statutes Section 216E.03, subdivision 7, and Minnesota Rule 7850.4100. The Project will support the State's goals to conserve resources, minimize environmental and human settlement impacts and land use conflicts, and ensure the State's electric energy security through the construction of efficient, cost-effective transmission infrastructure.

2.3 Permittee

The permittee for the Project is:

Permittee: Northern States Power Company, a Minnesota corporation
Contact: Timothy G. Rogers
Supervisor, Siting and Permitting
414 Nicollet Mall, (MP-8A)
Minneapolis, MN 55401
Phone: (612) 330-1955
Email: Timothy.G.Rogers@xcelenergy.com

2.4 Certificate of Need

A Certificate of Need is not required for the Project because it is not classified as a large energy facility under Minnesota Statutes Sections 216B.243 and 216B.2421, subdivision 2(3). While the Project is a high voltage transmission line ("HVTL") with a capacity of 100 kV or more, it is not more than 10 miles long in Minnesota, and it does not cross a state line. Therefore, a Certificate of Need is not required. *See* Minn. Stat. §§ 216B.2421, subd. 2(3) and 216B.243.

2.5 Route Permit, Alternative Permitting Process

The Minnesota Power Plant Siting Act ("PPSA"), Minnesota Statutes Chapter 216E, provides that no person may construct an HVTL as defined in the act without a Route Permit from the Commission. Minn. Stat. § 216E.03, subd. 2. Under the PPSA, an HVTL includes a transmission line that is 100 kV or more and is greater than 1,500 feet in length. Minn. Stat. § 216E.01, subd. 4. The proposed double circuit 115 kV transmission line is an HVTL greater than 1,500 feet in length; therefore, a Route Permit is required from the Commission prior to construction. The Project qualifies for review under the Alternative Permitting Process authorized by Minnesota Statutes Section 216E.04, subdivision 2(3), and Minnesota Rule 7850.2800, Subpart 1(C) (establishing alternative process for HVTLs between 100 and 200 kilovolts). Accordingly, Xcel Energy is following the provisions of the Alternative Permitting Process outlined in Minnesota Rules 7850.2800 to 7850.3900 for this Project.

2.6 Local Government Unit Notices

The Company sent pre-filing notice letters describing the Project to the two local government units, the City and Dakota County, on April 5, 2011. In response to the letters, the City and Dakota County requested meetings which were held on April 20, 2011 and June 7, 2011 respectively.

2.7 Notice to Commission

Xcel Energy notified the Commission on August 1, 2011, by letter (mailed and electronically filed) that Xcel Energy intended to use the Alternative Permitting Process for the Project. This letter complies with the requirement of Minnesota Rule 7850.2800, Subpart 2, to notify the Commission of this election at least 10 days prior to submitting an application for a Route Permit. A copy of the letter is attached in Appendix A.

3.0 PROJECT INFORMATION

3.1 Project Location

The proposed Project is located within Dakota County, Minnesota. **Figure 1** shows an overview of the Project location and route. **Table 2** identifies the location of the Project.

Table 2 – Project Location

City/Township Name	Township (N)	Range (W)	Section(s)
City of Burnsville	27N	24E	22, 23, 27, 28, 33, 32

3.2 Project Proposal

Xcel Energy proposes construction of a double circuit 115 kV transmission line between the Black Dog Substation and Structure 31A, just east of the Savage Substation. The Project will include:

- Construction of approximately 4.2 miles of a new 115 kV double circuit transmission line
- Construction of approximately 0.4 mile of single circuit 115 kV transmission line facilities to connect Transmission Line 0844 (750 feet) and Transmission Line 0861 (1,225 feet) to Black Dog Substation; and
- Removal of approximately 3.8 miles of two parallel existing 115 kV single circuit transmission lines (0844 and 0861) and structures.

The proposed structures for the new 115 kV double circuit line will be about 50 to 100 feet tall and will have an average span between 500 and 800 feet. The finish of the proposed poles will be either galvanized steel or weathering steel. The existing transmission line structures in this area are wood H-frame poles and galvanized steel lattice design. The proposed steel poles will give the new transmission lines a somewhat cleaner and more modern appearance. The conductors will be 795 thousand circular mils ("KCmil") 26/7 Aluminum Core Steel Supported ("ACSS") conductor or conductor of comparable capacity.

3.3 Need for Project

The proposed Project is needed to replace aging lines and to meet NERC reliability requirements.

Transmission Line 0844 and Transmission Line 0861 more than 50 years old and have wood poles. Both lines need to be rebuilt due to their deteriorating condition. Transmission Line 0844 has 37 structures with multiple poles. Of these poles, 98 have extensive woodpecker damage, 21 poles need full replacement, and 8 pole pilings need to be replaced. Similarly, the Transmission Line 0861 wooden structures have significant woodpecker damage and rotten pilings.

Transmission Line 0844 also needs to be rebuilt to meet NERC requirements. NERC requires that the system be designed so that under "system intact" conditions or "single contingency" (or "N-1") condition, – *e.g.*, when a single transmission line, generator or transformer is out of service – operators are able to reliably operate the system and serve all connected loads without any ongoing overloads or voltage problems. Transmission lines and transformers may have continuous ("normal") and short-term ("emergency") ratings. An overload condition exists when a transmission line, transformer or other piece of equipment is subjected to loadings that exceed its applicable rating.

Xcel Energy planning engineers have determined that, in its current state, Transmission Line 0844 will overload if the circuit breaker at Xcel Energy's Wilson Substation has an internal fault. The proposed rebuild of Transmission Line 0844 addresses this issue.

3.4 Project Schedule

Xcel Energy has begun efforts associated with the acquisition of regulatory permits and approvals. Once all required regulatory permits and approvals have been obtained, Xcel Energy anticipates beginning construction of the Project in the fourth quarter 2012, with a second quarter 2013 in-service date upon completion of construction. **Table 3** provides an estimated permitting and construction schedule summary.

Table 3 – Estimated Project Schedule

Project Task	Date
File Route Permit Application with the Commission	1st Quarter 2012
Route Permit Issuance	3rd Quarter 2012
Begin Transmission Line Construction	4th Quarter 2012
In-Service Date	2nd Quarter 2013

The Project schedule is based on information known as of the date of this filing and upon planning assumptions that balance the timing of implementation with the availability of crews and materials and with other practical considerations. This schedule may be subject to revision as further information is developed.

3.5 Project Cost

Xcel Energy estimates that the removal of the old transmission lines and the installation of the Project will cost approximately $8.69 million, as summarized in **Table 4**. Xcel Energy provides this estimate with a plus or minus 30 percent accuracy. Therefore, the total Project cost could be between $6.08 and $11.30 million. Of these costs, $1 million will be contributed by the Quarry for relocation of the transmission lines. This sum represents the incremental cost of relocating Transmission Line 0861 at the same time as Transmission Line 0844.

Table 4 – Estimated Project Cost

Project Item	Cost
Installation of New Transmission Line 0844 and 0861	$8.14 million
Removal of Existing Transmission Lines 0844 and 0861	$0.55 million
Total Project Cost	$8.69 million

Operation and maintenance costs for the transmission line will be nominal for several years, since the line will be new and minimal vegetation maintenance will be required. Typical annual operating and maintenance costs for 115 kV transmission voltages across Xcel Energy's Upper Midwest system area are on the order of $300 to $500 per mile of transmission right-of-way. The principal operating and maintenance cost includes inspections, which are usually done by fixed-wing aircraft and by helicopter on a regular basis.

4.0 FACILITY DESCRIPTION AND ROUTE SELECTION RATIONALE

4.1 Transmission Line Description

The Project involves rebuilding a new single pole 115 kV double circuit transmission line and removing the existing Transmission Lines 0844 and 0861 between the Black Dog Substation and Structure 31A, just east of Savage Substation. The entire new 115 kV transmission line will be constructed with single-pole, galvanized steel or weathering-steel structures. The proposed Project generally follows existing rights-of-way and property lines to the extent feasible. See the detailed Project maps attached in **Appendix B**, and further description below.

The majority of the Proposed Route for the new transmission line follows existing transportation lines and a significant segment is located on land owned by Xcel Energy. The Proposed Route for the new 115 kV transmission line is 4.6 miles long between the Black Dog Substation and where it realigns with the existing lines at Structure 31A, just east of the Savage Substation. The length of Transmission Lines 0861 and 0844 that will be removed is approximately 3.8 miles long. **Figure 2** provides an overview of the Proposed Route and **Appendix B** provides more detail on the Proposed Route.

Table 5 provides a detailed description of the Proposed Route, including road and waterbody crossings.

Table 5 – Detailed Description of Proposed Route

Route Direction	Approximate Length	Road and Public Water Crossings
Line 0844, Single Circuit: WEST-SOUTHWEST along Black Dog Road from Black Dog Substation	0.1 mile	--
Line 0861, Single Circuit: SOUTHWEST, then NORTHWEST across Black Dog Lake from Black Dog Substation	0.2 mile	Black Dog Lake
WEST-SOUTHWEST along Black Dog Road from Black Dog Substation	1.0 mile	--
SOUTHWEST from Black Dog Road to Black Dog Lake	0.5 mile	Black Dog Lake
WEST-SOUTHWEST along northern shoreline of Black Dog Lake	0.1 mile	Black Dog Lake
WEST-SOUTHWEST across Black Dog Lake	0.2 mile	Black Dog Lake
SOUTH-SOUTHWEST along western shoreline of Black Dog Lake and Cliff Road	0.5 mile	Black Dog Lake
SOUTHWEST across Interstate 35W	0.2 mile	I-35W
WEST along West Black Dog Road which turns into Chower Ave South	1.2 miles	--

Route Direction	Approximate Length	Road and Public Water Crossings
SOUTH along 126th Street West	0.6 mile	--
Total Proposed Route Length	**4.6 miles**	

The Black Dog Substation is located in Dakota County on the south side of the Minnesota River, which borders Hennepin County. It is located approximately 2.0 miles east of I-35W and approximately 1.1 miles north State Highway 13 (*see* **Figure B-1**). The Project terminus, near the Savage Substation, is located approximately 1.3 miles west of I-35W in Dakota County along 126th Street West. The entire project is located within the City of Burnsville municipal boundaries (*see* **Figure B-6**).

The Proposed Route is within or adjacent to the existing road rights-of-way for approximately 60 percent of the length of the route. More than 30 percent of the route crosses commercial/industrial and approximately 51 percent of the route crosses wetland (*see* Section 6.3). Approximately 40 percent of the Proposed Route is contained on Xcel Energy property located east of I-35W. The route crosses land zoned primarily for general industrial use (designated I-2) to the west of I-35W and land zoned as a conservancy district (designated CD) on the east due to the Minnesota Valley NWR (*see* Section 6.2).

There are no residences located within 1,000 feet of the Proposed Route centerline. Four cultural resource sites are located within 1.0 mile of the Proposed Route, including 3 archaeological sites and 1 historic architectural property. Two of the archaeological sites have been destroyed by modern development, and the third is a prehistoric artifact scatter. The Union Pacific rail line is the single historic architectural property, and while the rail line meets the criteria for National Register of Historic Places ("NRHP") listing, it has not been inventoried or nominated (*see* Section 6.4). The proposed Project will not affect the historic character of the two extant cultural properties.

The Proposed Route will run adjacent to Black Dog Lake, which is also a Public Waters Inventory ("PWI") watercourse. The Proposed Route will also span approximately 2.6 miles of wetland (*see* Section 6.5.3). The Blanding's turtle and peregrine falcon, both state-listed threatened species, have been identified by the Minnesota Department of Natural Resources ("MnDNR") within 1.0 mile of the Proposed Route (*see* Section 6.6.2).

4.2 Route Width

The PPSA, Minnesota Statutes Chapter 216E, directs the Commission to locate transmission lines in a manner that "minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring their electric needs are met and fulfilled in an orderly and timely fashion." Minn. Stat. § 216E.02, subd. 1. The PPSA also authorizes the Commission to meet its routing responsibility by designating a "route" for a new transmission line when it issues a Route Permit. The route may be up to 1.25 miles in width, within which the right-of-way for the facilities can be located. Minn. Stat. § 216E.01, subd. 8.

The right-of-way for the consolidated lines is proposed to be 100 feet. Based upon the following analysis, Xcel Energy respectfully requests that the Commission authorize a total route width of 400 feet to the west of I-35W centered on the proposed alignment, and 750 feet to the east of I-35W centered on the proposed alignment. Detailed maps showing the currently planned route widths and proposed alignment are provided on **Figures B-2** to **B8**. A wider route is requested on the east side to provide flexibility in siting near a potential bike trail proposed by the City of Burnsville (see **Figure 7** and **Figure B-17**), and a bald eagle nest that was confirmed to be located south of Black Dog Road (see **Figure B-13**). Xcel Energy does not propose to construct the proposed transmission lines within the Minnesota River; therefore, as depicted in **Figures B-1 through B-3**, the portion of the Proposed Route depicted within the Minnesota River has been excised.

4.3 Route Selection Process

In developing the routes proposed in this Application, Xcel Energy first analyzed the statutory and rule criteria set forth in the PPSA and Minnesota Rule 7850.4100. Xcel Energy also gave due consideration to the State's policy of non-proliferation of new infrastructure corridors and met with interested stakeholders and landowners, including local, state and federal agencies (*see* Section 7.0 and **Appendix C**). Throughout the process, Xcel Energy evaluated several route segment alternatives, considering feedback received.

The general vicinity of the Project was initially studied during the planning process by a team of siting, right-of-way, planning, environmental, ecological, and engineering personnel. The team also reviewed the general area surrounding the Project to help identify anticipated and significant routing issues that might arise.

The Company then performed an analysis of environmental resources in the vicinity of the Project by using computer mapping of data, including aerial photographs and topographic maps. Environmental resources identified within the vicinity of the Project are discussed in Section 6.0 of the Application. The Proposed Route is designed to best minimize overall impacts of the Project.

The Proposed Route was developed with the following primary objectives:

- minimize land use impacts by routing along existing road corridors;
- minimize land use impacts by routing along property lines and proposed reclamation site boundaries;
- minimize use of new rights-of-way; and
- minimize impacts on environmental and sensitive resources.

The Company believes the Proposed Route best meets the routing criteria and the objectives stated above. In particular, the Proposed Route maximizes the use of existing roads. Approximately 3.4 miles of the 4.6-mile-long Proposed Route are within or adjacent to existing road rights-of-way. The use of roads and Xcel Energy's own property was an important factor for this Project. Using existing corridors reduces and minimizes impacts on planned future

residential areas, commercial properties, and environmental and sensitive resources. No residences are located within 1,000 feet of the Proposed Route centerline.

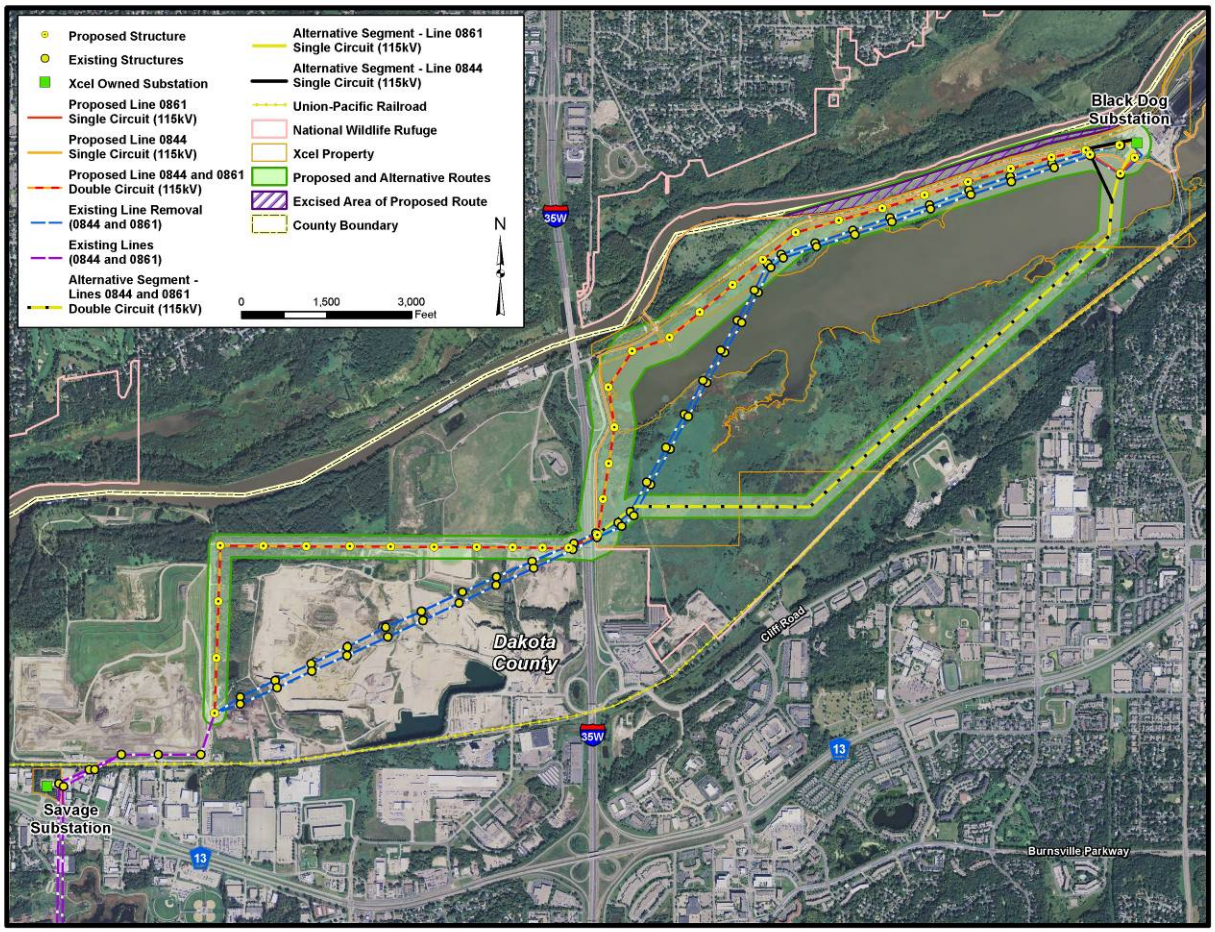
4.4 Alternative Route Segment Considered and Rejected on East End

The Project includes two distinct environmental settings. On the west end, west of I-35W, the route is dominated by the Quarry. On the east end, wetland areas are prominent around Black Dog Lake.

The common segment for the alternative and the Proposed Route includes the west end portion of the Proposed Route. This segment is 1.8 miles long and estimated to cost $2.71 million.

Xcel Energy identified and analyzed an alternative route segment for the Project on the east side of I-35W ("Alternative Route Segment") and an underground design based on concerns raised by the City of Burnsville and Dakota County regarding the Proposed Route's proximity to a contemplated bike path along Black Dog Road. This Alternative Route Segment is identified on **Figure 3** below and on the detailed Project maps in **Figure B-11**.

Figure 3 – East End Route Alternative



In addition to the information provided below, a detailed comparative analysis of the Proposed Route and the Alternative Route Segment is provided in **Section 7.0** of this Application.

Table 6 provides a detailed description of the Alternative Route, including road and waterbody crossings.

Table 6 – Detailed Description of East End Alternative Route Segment

Route Segment	Approximate Length	Road and Public Water Crossings
Alternative Route Segment, Rebuild East End of Line 0844 and Line 0861		
SOUTH from Black Dog Substation across Black Dog Lake	0.3 mile	Black Dog Lake
SOUTHWEST through large wetland complex	1.3 miles	--
WEST across large wetland complex to Interstate 35W	0.6 mile	--
Total Length of Alternative Route Segment	**2.2 miles**	

4.4.1 East End of Proposed Route

The east end of the Proposed Route is 2.6 miles long between Black Dog Substation and I-35W. The estimated cost is $5.96 million.

4.4.2 Alternative Route Segment

Dakota County recommended the Alternative Route Segment for the proposed double circuit line. This segment alignment follows the existing corridor for Xcel Energy's Transmission Lines 0832 and 5539 across Black Dog Lake and then turns to the southwest following Transmission Lines 0976, 0989, and 5539 (see Figures B-11 and B-12). The segment then deviates to the west as a greenfield route until realigning with the Proposed Route at the I-35W. The right-of- way would be approximately 100 feet wide, centered on the Alternative Route Segment, and would overlap the northernmost right of way of the existing 345kV and 115 kV lines by approximately 20 feet. As depicted in **Figure 3,** the route is 400 feet wide, centered on the alternative alignment.

The Alternative Route Segment has sensitive environmental resources that are not present on the Proposed Route. The south side of Black Dog Lake is comprised of a large wetland complex, which includes several native plant communities identified by the Minnesota County Biological Survey ("MCBS"). The United States Army Corps of Engineers ("USACE") and MnDNR have expressed concern regarding impacts on these native plant communities, particularly the calcareous fens in the area (*see* **Figure B-13**). Calcareous fens are designated as "outstanding resource value waters" in water quality regulations administered by the Minnesota

Pollution Control Agency ("MPCA") (Minnesota Rule 7050.0180) and they are given special protection through Minnesota Rules 8420.1010 to 8240.1060.

Xcel Energy undertook a preliminary evaluation of the Alternative Route Segment to assess impacts on sensitive native plant communities, constructability, and cost implications. The Company rejected this alternative for the following reasons:

- Site of High Biodiversity Significance: The south side of Black Dog Lake is comprised of a large wetland complex, which includes several native plant communities identified by the MCBS as a Site of High Biodiversity Significance. Such communities include Bulrush Marsh, Mesic Prairie, and Seepage Meadow/Carr as illustrated in **Figures B-11** and **B-13**. Sites of Biodiversity Significance have varying levels of native biodiversity and are ranked based on the relative significance of this biodiversity at a statewide level. Sites ranked as "high" contain very good quality occurrences of the rarest species, high quality examples of the rare native plan communities, and/or important functional landscapes. Disturbance to this ecologically sensitive area should be minimized to the extent feasible.

- Calcareous Fens: The route would cross wetland complexes that contain five state-listed calcareous fens (*see* **Figure B-13**). Any activity that has the potential to affect the current, cross-section, or character of calcareous fens is a regulated activity in Minnesota under Minnesota Statutes Section 103G.223 (Calcareous Fens) and Minnesota Rule 8420.0935 (Standards and Criteria for Identification, Protection, and Management of Calcareous Fens). Such activity can only be authorized by the Commissioner of the MnDNR after the preparation and approval of a Calcareous Fen Management Plan. Minn. Stat. § 103G.223. MnDNR has advised that authorization to disturb a calcareous fen has only been granted once or twice in the state. If the crossing were authorized, creating and implementing a Fen Management Plan would take extensive research, coordination with state and federal agencies, time, and additional cost.

- Reliability: The alternative segment would locate an additional double circuit 115 kV/115 kV transmission line in the same corridor as an existing double circuit 345 kV/345 kV line and a single circuit 115 kV line. Designing lines to exit south of the Black Dog Substation would be more difficult and would require an extended outage of Transmission Line 0832, a single circuit 115 kV line between Black Dog Substation and Riverwood Substation. In addition, when high voltage transmission lines are concentrated in an area they are at greater risk of a common outage in the event of a catastrophic event such as a tornado or other storm. Consequently, this alternative segment provides less reliability benefit than the Proposed Route.

- Construction Challenges: Construction challenges would be greater along this route due to the presence of high water and soils with poor bearing strength underlain by coarse textured sediments (sands and gravels) with high positive hydraulic gradients. If necessary, dewatering during construction would likely cause adverse impacts on

calcareous fens, sensitive soils, and plant communities. Extensive use of timber or synthetic mats and specialized low-ground weight equipment would be required at a minimum, to stabilize heavy construction equipment during construction. These environmental conditions would also require substantial matting and environmental mitigation whenever the line needs to be accessed for maintenance or repair, increasing costs and potentially extending the duration of an outage event. In contrast, the Proposed Route has ready accessibility via Black Dog Road and contains far more stable, less-saturated soils.

4.4.3 Underground Design and Construction

The Company analyzed underground construction of Transmission Lines 0844 and 0861 east of I-35W and concluded it is not a reasonable design alternative, regardless of the route chosen, due to increased environmental impacts to wetlands during construction and potential repair, cost and reliability considerations. A general description of underground construction and an analysis of these factors is provided below.

Underground Construction Techniques

The Company and its Wisconsin affiliate currently own and operate approximately 12 miles of underground transmission line throughout the five-state upper-Midwest region compared to 7,300 miles of high voltage transmission lines. Underground design has generally been used where no viable overhead route was available, typically due to close proximity to an airport or to multi-level buildings at heights taller than the proposed overhead transmission structures where industry standards required underground construction.

There are three standard types of underground construction for transmission lines: surface cut open trenching, horizontal boring, and horizontal directional drilling ("HDD"). Trenching would be the preferred method of underground transmission line construction as the construction progress is easily controlled, it is readily adaptable to most conditions found in the field, and it is the most cost effective method of underground construction. This method, however, requires substantial mitigation efforts including those necessary to shore up the trench for worker safety, to dewater the trench to keep it dry, and to backfill the trench after installation has been completed with selective materials that improve heat transfer.

Double circuit underground transmission lines can be trenched either horizontally or vertically. Horizontal installation would require a trench approximately 15 feet wide and six feet deep while vertical installation would require a trench approximately five feet wide and 12 feet deep. The physical conditions of the construction area dictate which installation method can be used. Trenching also requires landscaping and re-vegetation to stabilize the disturbed areas. Horizontal boring and HDD are more expensive than trenching and are typically only used to pass cables, pipes, and conduits below existing barriers that are difficult to trench such as deep ravines, railroad crossings, major roads, and rivers. Horizontal boring or HDD are not often used for underground transmission line construction over extended distances, but is used most often to pass obstacles such as those previously discussed.

All underground construction requires the installation of a duct system to protect the conduit and the installation of cable vaults with manhole access to facilitate cable installation and for future inspection and repair. Each duct would be approximately two feet wide and three feet in depth and are constructed out of concrete when the trenching method of construction is used. For the Project, two identical concrete duct banks, each containing four six-inch polyvinyl chloride ("PVC") conduits for the transmission circuits and two two-inch PVC conduits for ground continuity and communications needs, would be required.

The duct banks could be installed adjacent to each other in the same trench, approximately four feet apart, or in separate trenches, depending on physical limitation of the route, for example, whether there is enough room to install both ducts on the same side of a road or if they need to be installed on opposite sides due to space restrictions. Initial construction of duct banks typically proceeds at a rate of 200 feet per day, but may take longer in the Project area based on wet soil conditions found all along this portion of the Project. A typical cable vault with manhole access is approximately 24-25 feet in length by 14 feet in width by 7-10 feet in depth. A vault must be installed every 1,500 feet or whenever there is a major change in the direction of the route, whichever occurs first.

Two types of conductor can be used for underground construction: high voltage extruded dielectric ("HVED") or high pressure fluid filled ("HPFF") cables. HVED cable consists of stranded copper conductor surrounded by solid electrostatic conductor shield and insulation. These cables do not present the potential for fluid leaks like HPFF cables. Additionally, HPFF cables would require a pumping plant and storage tanks for the fluids at each end of the underground ducts. This equipment is not required for HVED cables.

Analysis of Factors

For the following reasons, the Company determined that underground construction is not a reasonable alternative for the Project along the Proposed Route:

Environmental Impacts

Although the aesthetic impacts of overhead transmission structures are eliminated with underground transmission line construction, there are other aesthetic impacts resulting from this design. This portion of the Project is within the Minnesota Valley NWR and is located on property owned by the Company.

An underground installation of a double circuit transmission line would require excavation of a approximately 1.6-mile-long trench traveling west from Black Dog Substation. The trench would be approximately 17 feet wide (top of trench) and 6 feet deep, to allow for two 2-foot-wide linear concrete duct systems to house the transmission lines. To cross underneath Black Dog Lake, HDD would be used.

Between Black Dog Substation and the start of the HDD, underground installation would require the removal of native vegetation during clearing, grading, and trenching activities along the entire length of an approximate 100-foot-wide construction workspace, totaling an area of approximately 20 acres. In addition, to facilitate installation of transmission lines, future

inspections, and repair, seven or more manhole access vaults would be required approximately every 1,500 feet and at significant direction changes along the route. Each vault would permanently impact an area of approximately 25 feet long, 14 feet wide, and 10 feet deep. During construction, additional areas would be required for necessary drilling or boring equipment. Also, extensive erosion control measures would be required along the length of the portion to be constructed underground, where such measures are only required in the vicinity of structure locations for overhead construction.

The clearing, grading, trench excavation and installation of the duct systems and vaults would occur in an area that is dominated by wetlands. Trenching through wetlands can be difficult as the sidewalls of the trench frequently slough and collapse, requiring a wider trench and possible increase in the ground disturbance area. Also, due to the high water table in this area, groundwater will infiltrate the trench, likely requiring dewatering for the duration the trench remains open. A significant volume of trench water would likely need to be discharged to adjacent wetland areas and near the banks of Black Dog Lake and Minnesota River. In contrast, the total impact area for installation of aboveground structure foundations would total approximately 2 acres, assuming a general construction footprint of 40 feet by 140 feet per structure. Water discharge requirements for structure foundations would be negligible.

The following table shows a comparison of impacts between the traditional aboveground installation and the underground installation along the Proposed Route.

Table 7 - Comparative Analysis of Aboveground and Underground Line Installation

Construction Method	Temporary Construction Impact Area (acres)	Volumetric Permanent Impacts (yd^3)
Aboveground Transmission Line Installation [a]	2.0	525.0
Underground Transmission Line Installation [b]	20.0	907.4

[a] Based on a approximate 140x40 foot temporary construction workspace and an average 15x15x3 foot permanent structure impact.

[b] Based on a approximate 100-foot-wide temporary construction workspace and average 25x14x10 foot permanent manhole access vault.

Costs

Construction costs for a double circuit underground 115 kV transmission line constructed using the surface cut open trench method are approximately 5 to 10 times higher per mile than costs for an overhead 115 kV transmission line constructed on steel self-weathering or galvanized steel poles. The underground construction incremental cost depends greatly on the amount of right-of-way available. The cost for underground construction increases from this baseline comparison when HDD or horizontal boring are used during installation. Recently, the Company analyzed the incremental cost of underground surface-cut open trench construction as

compared to overhead cantilever steel structure construction for a double circuit 115 kV transmission line. (Minnesota Commission Docket No. E002/TL-09-38). The project involved two new 115 kV lines approximately 1.4 miles in length along an abandoned railroad corridor. The overhead design was estimated to cost approximately $2.8 million; underground design was estimated to cost approximately $13.6 million. The costs per mile would likely be greater for the Project due to the environmental conditions.

Reliability Considerations

Underground transmission lines are generally subject to fewer outages than overhead transmission lines. However, the repair time for outages of underground transmission lines is longer. Overhead line outages are typically repaired in 10-24 hours after the outage event is reported. An underground facility can take several weeks to repair. Also, unlike an overhead outage where the area to be repaired can be readily identified by a visual survey of the transmission line, identifying the cause of an underground transmission line outage requires accessing the duct and then inspecting the conductors for damage. Additionally, if both ducts are installed in the same trench, both transmission lines would need to be taken out of service while the area needing to be repaired is located which would result in additional wetlands impacts.

4.5 Design Options to Accommodate Future Expansion

The proposed 115 kV double circuit transmission line is designed to meet current and projected needs.

5.0 ENGINEERING AND OPERATIONAL DESIGN

5.1 Structures, Right-of-Way, Construction and Maintenance

5.1.1 Transmission Structures – Proposed Route

The proposed structures for the 115 kV double circuit transmission line will be about 50 to 100 feet tall and will have an average span between 500 and 800 feet. The proposed right-of-way required for the facilities is 100 feet wide. Schematics of the proposed structure types are shown below on **Figure 4**, **Figure 5**, and **Figure 6.**

The finish of the proposed poles will be either galvanized steel or weathering steel. The existing transmission line structures in this area are wood poles of H-frame construction, and galvanized steel lattice and steel single pole design. The proposed steel poles will give the new transmission line a more modern appearance. The 115 kV conductor proposed for the Project will be 795 KCmil 26/7 ACSS conductor per phase or conductor of comparable capacity. **Table 8** summarizes the structure designs and foundations for the Proposed Route transmission line.

Table 8 - Transmission Structure Design

Line Type	Structure Type	Structure Material	Right-of-Way Width (feet)	Structure Height (feet)	Foundation	Foundation Diameter (feet)	Span Between Structures (feet)
115 kV Double Circuit	Single pole – Davit Structure	Galvanized/ Weathering Steel	100	80 to 100	Concrete	8 to 10 -	500 to 800
115 kV Double Circuit	Single pole –Delta Structure	Galvanized/ Weathering Steel	100	50 to 80	Concrete	8 to 10	500 to 800
115 kV Single Circuit	Single Pole – Y-Frame Structure	Galvanized/ Weathering Steel	100	50 to 60	Concrete	8 to 10	500 to 800

The proposed transmission line will be designed to meet or surpass relevant local and state codes, the National Electric Safety Code ("NESC") and Company standards. Appropriate standards will be met for construction and installation, and applicable safety procedures will be followed during and after installation.

Figure 4 – Typical Dimension Requirements for a Single Pole 115 kV Double Circuit Davit Structure

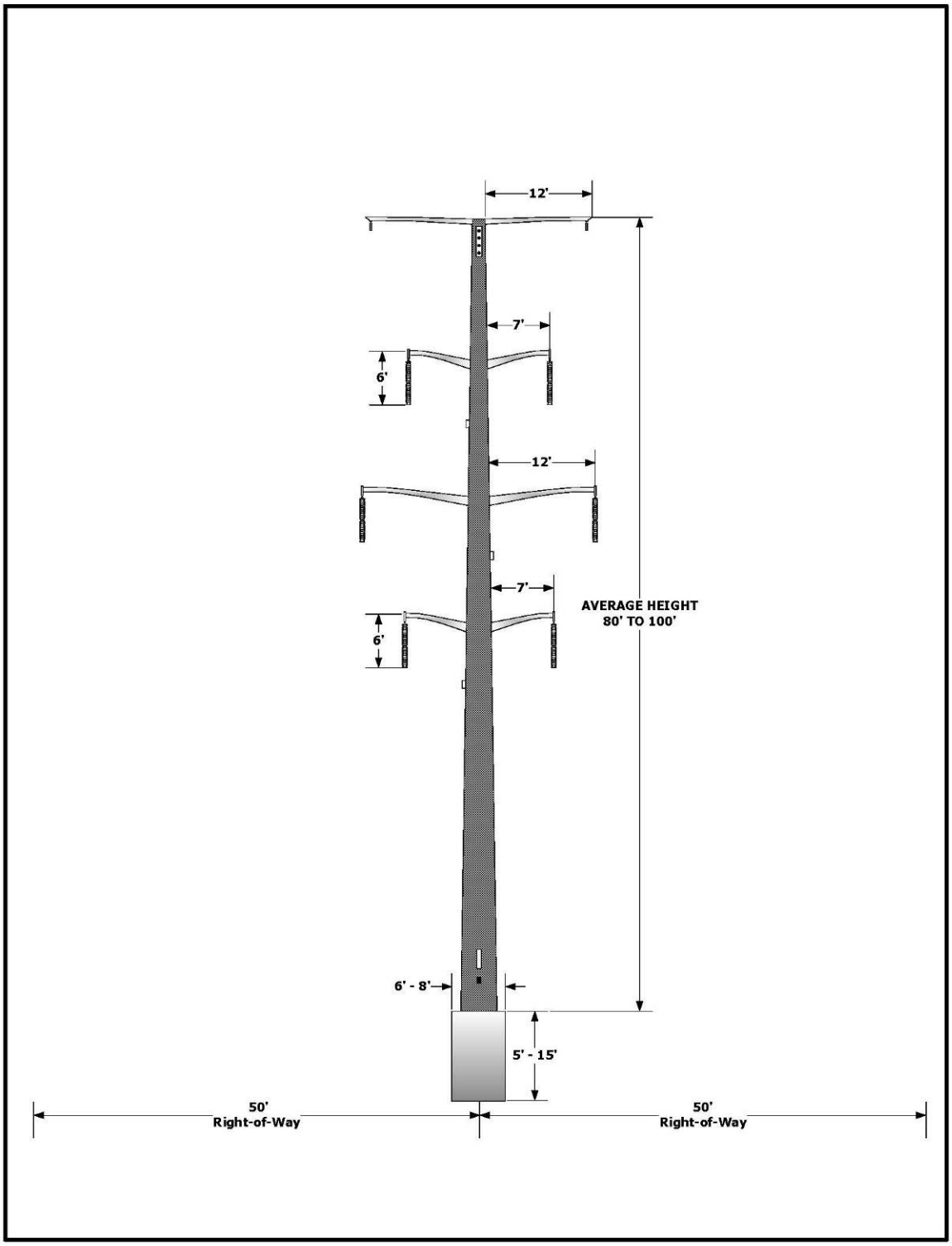


Figure 5 – Typical Dimension Requirements for a Single Pole 115 kV Double Circuit Delta Structure

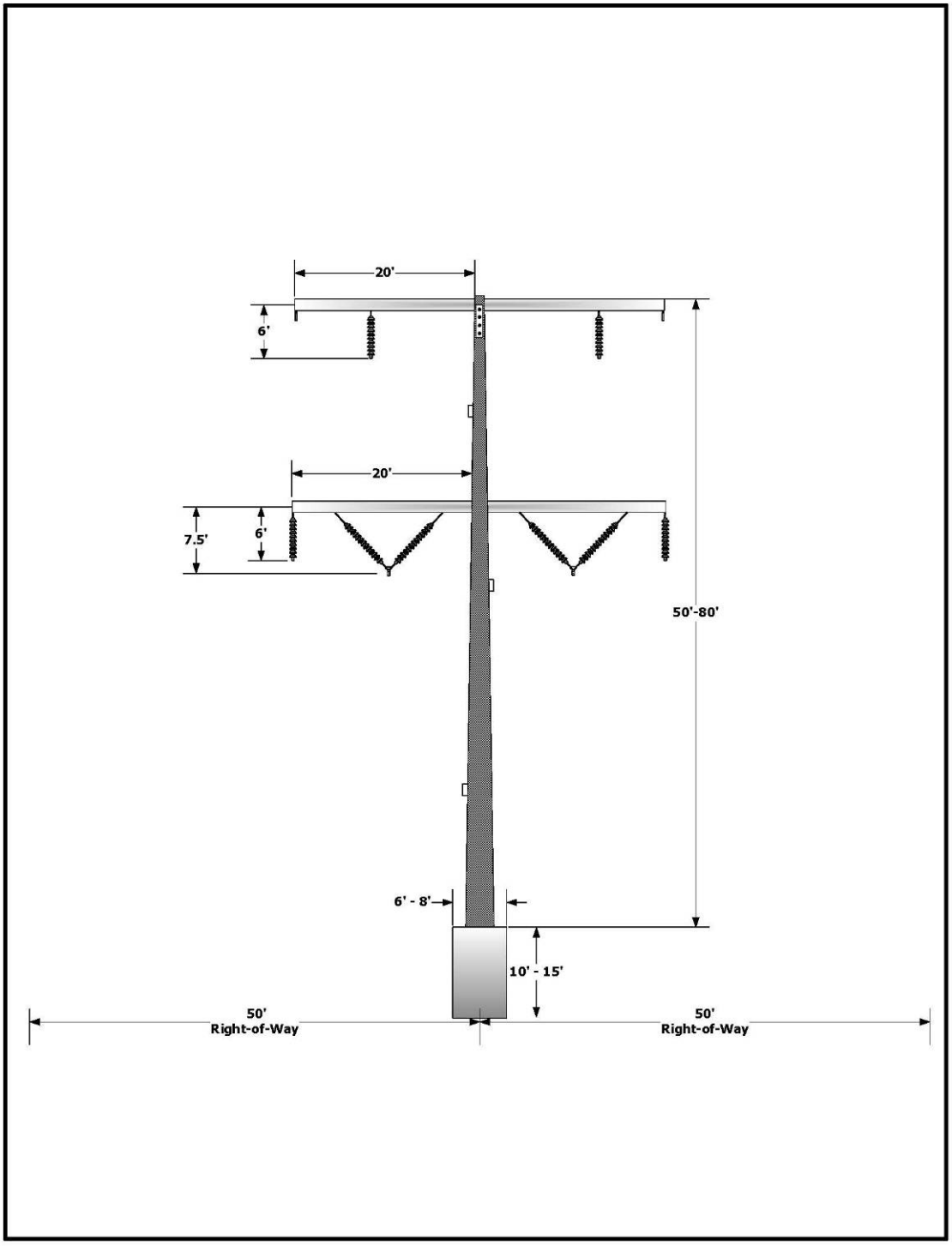
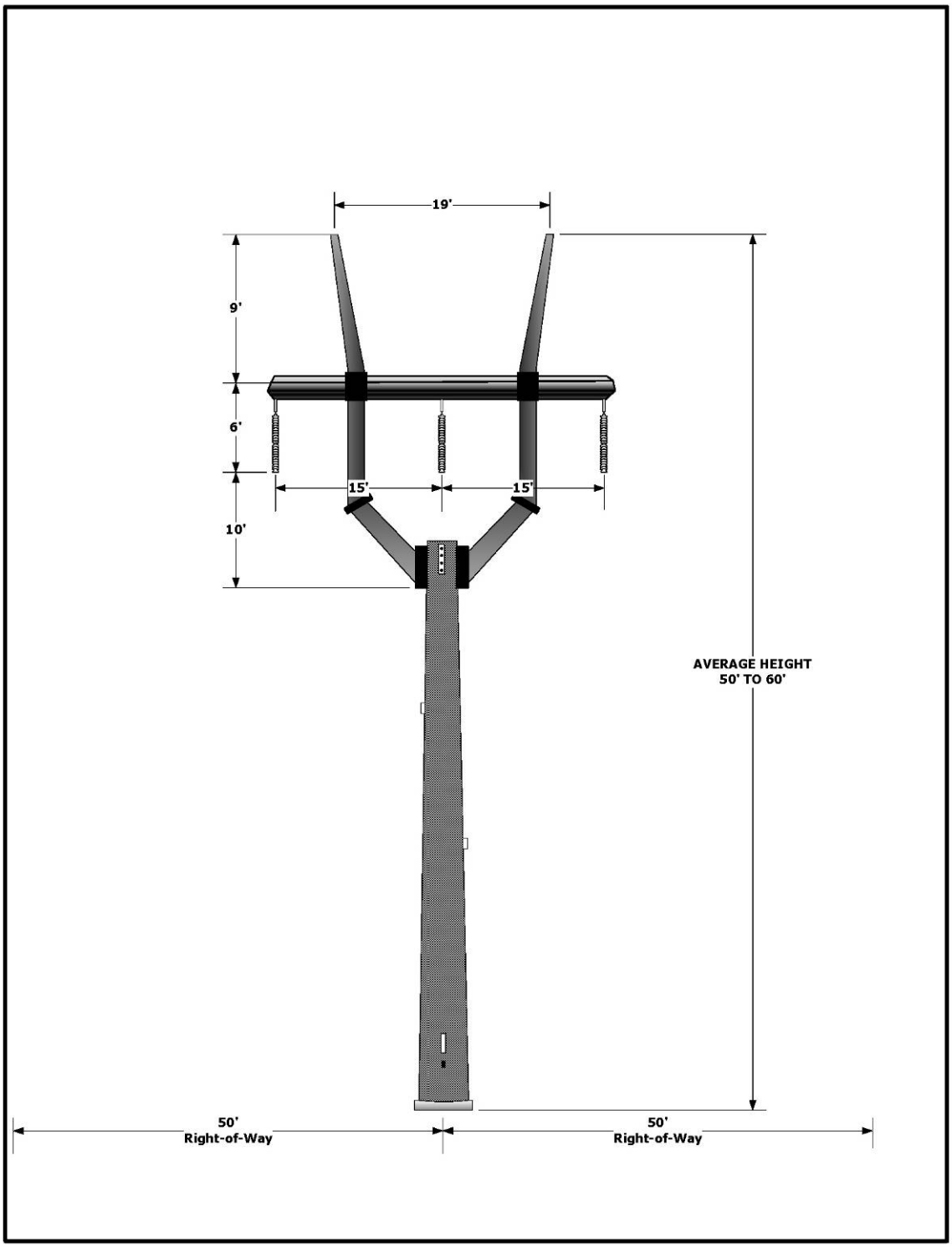


Figure 6 – Typical Dimension Requirements for a Single Pole 115 kV Single Circuit Y-Frame Structure



5.1.2 Right-of-Way Width – Proposed Route

The proposed right-of-way is 100 feet. Where the Proposed Route parallels other existing infrastructure rights-of-way (e.g., roads, railroads, other utilities, etc.), the easement required from the adjacent landowner may be of lesser width may be required because a portion of the transmission right-of-way can overlap with the public right-of-way. For the crossing of I-35W, the alignment is proposed to follow the existing crossing area and poles will be placed in conformance with Minnesota Department of Transportation's ("MnDOT's") utility permitting requirements.

On the west end of the Project near the Quarry, the City of Burnsville plans to construct a road north of the Quarry along the existing private road owned by the Quarry (*see* **Figures B-6** to **B-9**). The Quarry-owned road, West Black Dog Road which turns into Chower Avenue, runs east/west on the northern edge of the property. The proposed alignment along Chower Avenue is offset at least 30 feet from the edge of the existing road surface. While the city has not developed specific plans for the new road, no conflicts with the transmission facilities are anticipated. **Figure 7** shows the right-of-way configuration along Chower Avenue. The Company will work with the City of Burnsville on the alignment as further details regarding the new road become available.

Along Black Dog Road, east of I-35W, the transmission line will parallel Black Dog Road on the south side for approximately 1.2 miles and will provide adequate setback to accommodate a potential future bike path contemplated by Dakota County (*see* **Figure B-17**). **Figure 8** illustrates the proposed structure and right-of-way configuration along the Proposed Route as well as the potential bike path locations.

Figure 7 – Right-of-Way Configuration Along Chower Avenue / W. Black Dog Road

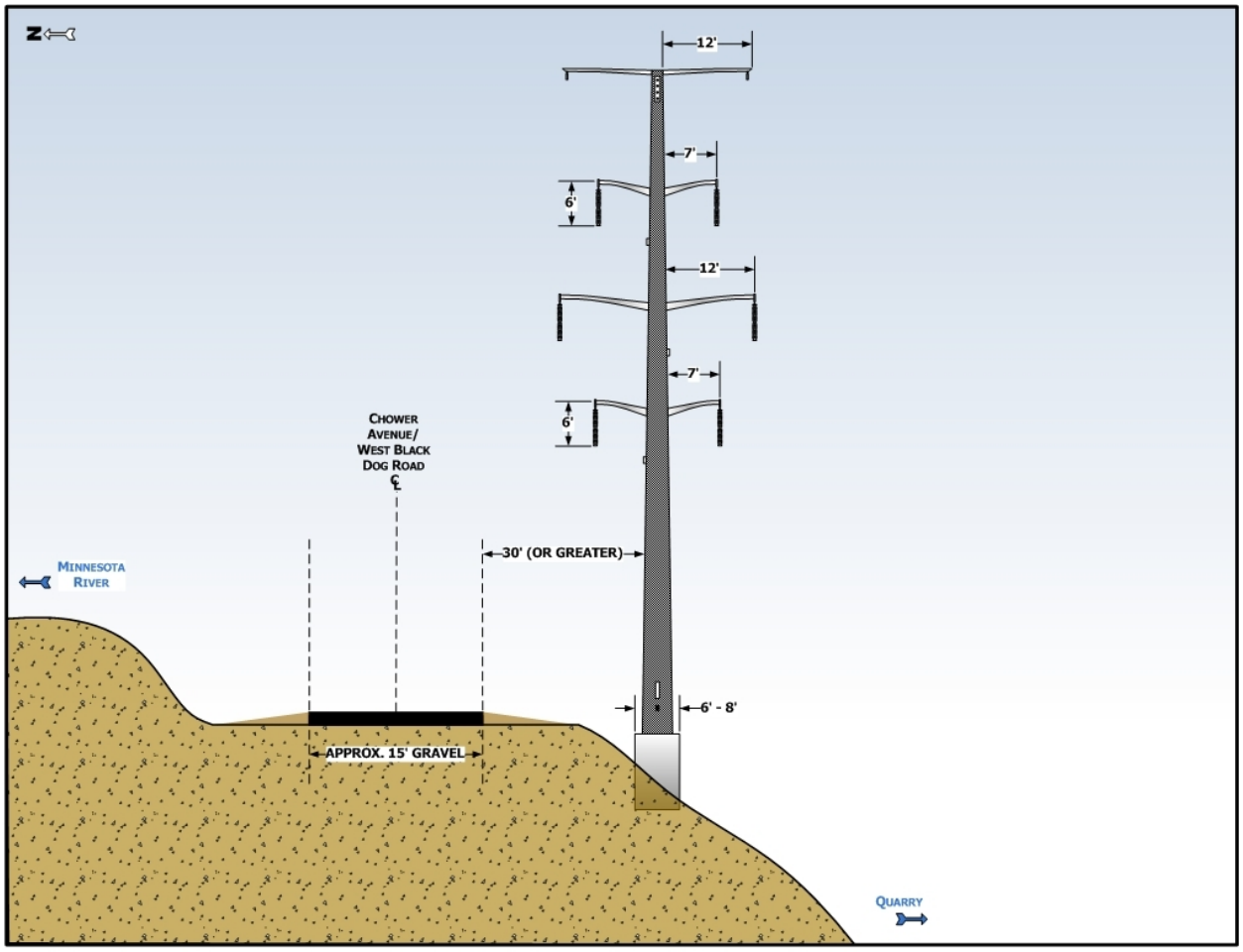
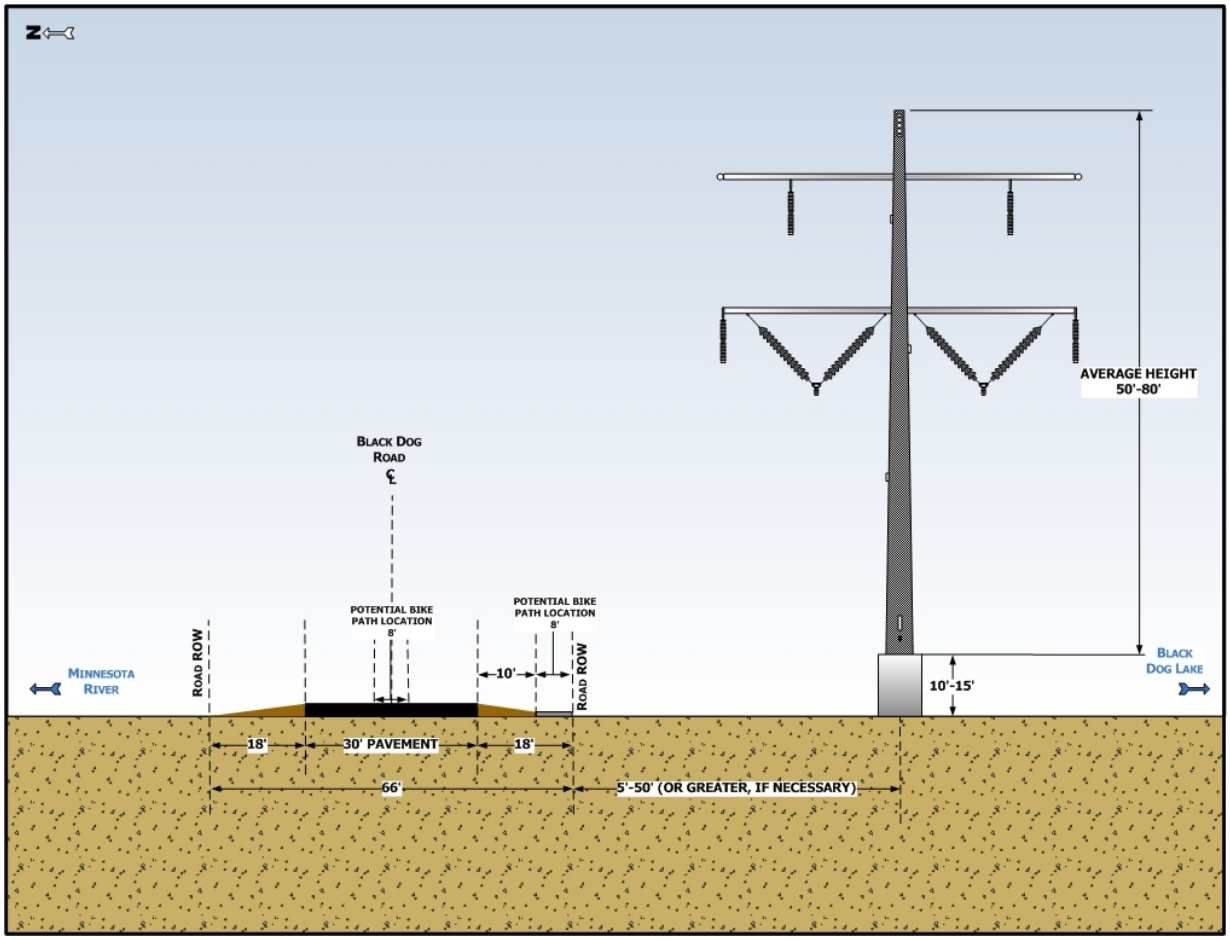


Figure 8 – Right-of-Way Configuration Along Black Dog Road



5.1.3 Requirements and Acquisition

As shown in **Figure B-10**, approximately 40 percent of the Proposed Route crosses lands owned by Xcel Energy. For portions of the Project that cross lands not owned by Xcel Energy, easement rights will be acquired to accommodate the new facilities. The evaluation and acquisition process includes title examination, initial owner contacts, survey work, document preparation, and purchase.

On the east end of the Project, no additional easements will be required. The Proposed Route is located on Xcel Energy property with the exception of the portion across Black Dog Lake which is managed by the MnDNR.

On the west side, the Proposed Route crosses a portion of the limestone quarry. New easement rights will be acquired from the Quarry on their property for the relocated transmission lines and the existing transmission line easements will be released where they are not required for the relocated transmission lines.

The Proposed Route also crosses over two parcels of land owned by Freeway Transfer and R.B. McGowan (ownership is the same) immediately west of I-35W and northeast of the Quarry. In this area, specifically, the Proposed Route will utilize the same easement area that is currently

being used for the existing transmission lines. No additional easement rights will be needed over these two parcels as the existing easements are sufficient for the new transmission lines.

Xcel Energy has had ongoing discussions with landowners crossed by the proposed Project and anticipates the ability to work with each landowner separately to address their concerns to reach an agreement for the purchase of land rights as needed. Numerous micro-siting options for relocating the transmission lines have been discussed and analyzed, and based on several previous meetings and discussions with the Quarry, Freeway Transfer, and R.B. McGowan, the Proposed Route is favorable to the affected landowners. As part of the right-of-way acquisition process, the Xcel Energy has been discussing the construction schedule and construction requirements with the owner of each parcel. When an agreement is reached, the right-of-way agent will prepare the documents required to complete each transaction. Some of the documents that may be required include easement, and Conditional Release of existing easements.

5.1.4 Construction and Restoration Procedures

Construction will begin after all federal, state and local approvals are obtained, soil conditions are determined suitable for construction, and the design is completed. The precise timing of construction will take into account various requirements that may be in place due to permit conditions, system loading issues, available workforce, and materials.

The actual construction will follow standard construction and mitigation practices, including best management practices ("BMPs"), which have been developed from experience with past projects. These practices address right-of-way clearance, staging, erecting transmission line structures, and stringing transmission lines. Construction and mitigation practices to minimize impacts will be developed based on the proposed schedule for activities, permit requirements, prohibitions, maintenance guidelines, inspection procedures, terrain, and other practices. In certain cases some activities, such as schedules, are modified to minimize impacts to sensitive environments.

Construction crews will maintain sound water and soil conservation practices during construction and operation of the facilities to protect topsoil and adjacent water resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, and stabilizing restored soil. Crews will make efforts to avoid major disturbance of individual wetlands and drainage systems during construction. This will be accomplished by strategically locating new access roads and spanning wetlands and drainage systems where possible.

Portions of vegetation that are disturbed or removed during construction of transmission lines will naturally reestablish to pre-disturbance conditions. Resilient species of common grasses and shrubs typically reestablish with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities along the proposed transmission line corridor may require assistance in reestablishing the vegetation stratum and controlling soil erosion. When this scenario appears imminent or it is not feasible to span the wetland, construction crews will consider the following techniques during construction and restoration to minimize and mitigate impacts:

- Construction within Black Dog Lake will be conducted using a modular barge and coffer dam system;

- When possible, construction within wetlands will be scheduled during frozen ground conditions;

- When construction during frozen winter conditions is not possible, construction mats will be used where wetlands would be impacted;

- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (i.e., shortest route);

- The structures will be assembled on upland areas before they are brought to the site for installation; and/or

- Commonly used methods to control soil erosion and assist in reestablishing vegetation include, but are not limited to:

    - erosion control blankets;

    - silt fence installation;

    - hydro seeding; and

    - planting individual seeds or seedlings of native species.

These erosion control and vegetation establishment practices are regularly used in construction projects and are referenced in the construction storm water permit plans. Long-term impacts are also minimized by utilizing these construction techniques.

Structure removal during winter conditions is problematic on Black Dog Lake. The lake is used for cooling effluent water from the Plant and does not produce safe ice thickness levels required for vehicle operation; therefore, the pile foundations located within the lake will be removed using a modular barge and coffer dam system, if necessary. Modular barge construction will consist of the same activities with equipment and workers located on sections of barges tied together after they are placed into the water.

5.2 Electric and Magnetic Fields

The term electromagnetic fields ("EMF") refer to electric and magnetic fields that are coupled together, such as in high frequency radiating fields. For the lower frequencies associated with power lines (referred to as "extremely low frequencies" ("ELF")), EMF should be separated into electric fields ("EFs") and magnetic fields ("MFs"), measured in kilovolts per meter ("kV/m") and milliGauss ("mG"), respectively. These fields are dependent on the voltage of a transmission line (EFs) and current carried by a transmission line (MFs). The intensity of the electric field is proportional to the voltage of the line, and the intensity of the magnetic field is proportional to the current flow through the conductors. Transmission lines operate at a power frequency of 60 hertz (cycles per second).

See Section 6.2.2 for additional information on this subject relating to public health and safety.

5.2.1 Electric Fields

There is no federal standard for transmission line electric fields. The Commission, however, has imposed a maximum electric field limit of 8 kV/m measured at one meter above the ground. *In the Matter of the Route Permit Application for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota,* Docket No. ET-2/TL-08-1474, Order Granting Route Permit (*adopting* ALJ Findings of Fact, Conclusions and Recommendation at Finding 194 (April 22, 2010 and amended April 30, 2010)) (September 14, 2010). The standard was designed to prevent serious hazards from shocks when touching large objects parked under AC transmission lines of 500 kV or greater. The maximum electric field, measured at one meter above ground, associated with the Project is calculated to be 1.013 kV/m (*see* **Table 9** below).

Table 9 – Calculated Electric Fields (kV/m) for Proposed Single Pole 115 kV Double Circuit Transmission Line Design (3.28 feet above ground)

Structure Type	Maximum Operating Voltage (kV)	Distance to Proposed Centerline (feet)												
		-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
Single Pole Y-Frame 115kV Single Circuit	121	0.00	0.01	0.10	0.22	0.51	0.98	0.30	0.98	0.51	0.22	0.10	0.01	0.00
Single Pole Delta 115kV/115kV Double Circuit	121	0.03	0.05	0.13	0.16	0.41	1.39	2.42	1.39	0.41	0.16	0.13	0.05	0.03
Single Pole Davit Arm 115kV/115kV Double Circuit	121	0.01	0.02	0.02	0.04	0.24	0.74	1.16	0.74	0.24	0.04	0.02	0.02	0.01

5.2.2 Magnetic Fields

There are presently no Minnesota regulations pertaining to MF exposure. Xcel Energy provides information to the public, interested customers and employees so they can make informed decisions about MFs. Such information includes the availability for measurements to be conducted for customers and employees upon request.

The magnetic field profiles around the proposed transmission lines for each structure and conductor configuration being considered for the Project is shown in **Table 10.** Magnetic fields were calculated under normal system conditions (systems intact) for the expected peak and average current flows. The peak magnetic field values are calculated at a point directly under the transmission line and where the conductor is closest to the ground. The same method is used to calculate the magnetic field at the edge of the right-of-way. The magnetic field profile data show that magnetic field levels decrease rapidly as the distance from the centerline increases (proportional to the inverse square of the distance from source).

Table 10 - Calculated Magnetic Flux Density (milligauss) for Proposed Single Pole 115kV Single and Double Circuit Transmission Line Design (3.28 feet above ground)

Structure Type	System Condition	Current (Amps)	Distance to Proposed Centerline (feet)												
			-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
Single Pole Y-Frame 115 kV Single Circuit	Peak	411	0.72	1.65	6.43	10.92	21.35	45.67	65.76	46.13	21.79	11.27	6.71	1.80	0.82
	Average	247	0.43	0.99	3.86	6.56	12.83	27.45	39.52	27.72	13.10	6.77	4.03	1.08	0.49
Single Pole Delta 115kV/115kV Double Circuit	Peak	411	1.94	4.25	15.50	25.30	45.95	85.52	99.61	85.52	45.95	25.30	15.50	4.25	1.94
	Average	247	1.17	2.56	9.32	15.20	27.62	51.39	59.86	51.39	27.62	15.20	9.32	2.56	1.17
Single Pole Davit Arm 115 kV/115kV Double Circuit	Peak	411	1.35	2.80	9.09	13.76	21.78	33.32	40.07	33.32	21.78	13.76	9.09	2.80	1.35
	Average	247	0.81	1.68	5.46	8.27	13.09	20.03	24.08	20.03	13.09	8.27	5.46	1.68	0.81
*Peak and Average loading was calculated with loads estimated for 2017. *Calculated reading location is 3.28 feet (1 meter) above ground and at the horizontal distances listed in the table.															

The magnetic field produced by the transmission line is dependent on the current flowing on its conductors. Therefore, the actual magnetic field when the Project is placed in service is typically less than that illustrated in the charts. This is because the charts represent the magnetic field with current flow at expected normal peak based on projected regional load growth through 2016-2018, the maximum load projection timeline available. Actual current flow on the line will vary, so magnetic fields will be less than peak levels during most hours of the year.

5.2.3 Stray Voltage

Stray voltage (also known as Neutral to Earth Voltage ("NEV")) is a condition that can occur on the electric service entrances to structures from distribution lines, not transmission lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings, such as barns and milking parlors. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. Transmission lines, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line. Appropriate measures will be taken to prevent stray voltage problems when the transmission lines proposed in the Application are parallel to or cross distribution lines.

See Section 6.2.2 for additional information on this subject relating to public health and safety.

6.0 LAND USE, RECREATION, HISTORIC AND NATURAL RESOURCES

6.1 Environmental Setting

The Project is located within the Minnesota and Northeast Iowa Morainal Section (222M), a section within the biogeographic province known as the Eastern Broadleaf Forest Province under the Ecological Classification System ("ECS") developed by the MnDNR and the U.S. Forest Service (MnDNR, 2011a). The Project is further located on the border of the Anoka Sand Plain and the St. Paul Baldwin Plains and Moraines subsections of the Minnesota and Northeast Iowa Morainal Section. The Project location is surrounded by wetland and riparian habitat and provides habitat for many species of plants and animals.

Historically, this area was primarily floodplain and terrace forests of silver maple, cottonwood, box-elder, green ash and elm within, and along, the terrace forests river valley (MnDNR, 2011b). Wetland complexes associated with the Minnesota River Valley system are present throughout the Project area.

Current USGS Landuse/Landcover database information characterizes the Project area as consisting of developed and barren land with open water and intermittent strips of deciduous forest mainly along Black Dog Road and the railroad corridor on the south side of Black Dog Lake (*see* **Figure B-14**).

The western portion of the Project is comprised of developed commercial/industrial land near the sand and gravel mine and landfill; additional woodlands exist along the north side of the sand and gravel mine. The land use within the eastern portion of the Project is generally open with scattered forest north of Black Dog Lake where the new 115 kV double circuit transmission line is proposed. The Project is within the City of Burnsville, east of the City of Eagan, and within the Minnesota Valley NWR (*see* **Figure B-10**).

The Proposed Route is proposed to be located near existing transmission line and road infrastructure, a sand and gravel mine, and a landfill. The Project, if constructed along the Proposed Route, will not have significant effects on land use, social, cultural and economic resources or effects on the natural environment, including wetlands, threatened or endangered species, or archaeological and historical sites. The potential effects of the Project on these areas are included in the discussion below. The Project has been conceived and will be designed and operated with the objective of minimizing adverse environmental effects. The engineering of several project features described in Section 3 has included consideration of the setting of the site.

6.1.1 Topography

The Lower Minnesota River Major Watershed is one of the twelve major watersheds of the Minnesota River Basin. However, melt waters and glacial lakes associated with the last glacial advance contributed large volumes of meltwater to rivers that cut deep valleys along the present course of the Minnesota, St. Croix, and lower Mississippi Rivers located east and north of the Project. The Project is located within the Minnesota River Valley floodplain with terrace bluffs along the rivers corridor. The topography of the area is generally level; however, the gravel mine and landfill operations has altered the topography on the west side of I-35W. There are

extensive areas of wetlands present in the Project area. Prior to settlement, the area consisted of floodplain and forested terrace bluffs, which included forests of silver maple occupying the active floodplains, while forests of silver maple, cottonwood, box-elder, green ash, and elm occupied the terraces. Steep slopes in the vicinity are generally limited to portions of the Minnesota River bank and the floodplain terraces, which is outside the proposed location of the Project.

6.1.2 Geology and Soils

The topography of this region was formed by the retreat of the Wisconsin glaciers and is characterized by patchwork hilly moraines, flat outwash plains, and shallow to very deep lakes. The soils were formed by glacial retreat and subsequent forest vegetation, resulting in medium to coarse texture loams. The Project is about eight miles south and west of the junction of the Minnesota and Mississippi Rivers. This eastern-most portion of the Minnesota River is a broad lowland averaging one mile wide, with intermittent bedrock outcrops and higher river bluffs on both the north and south sides of the river. Following the last glacial retreat, the river valley was further altered by flooding events and alluvial action, and includes lakes and wetlands on both sides of the river.

Based on the Geologic Atlas of Dakota County, Minnesota (1990), the surficial geology of the Project area consists of organic deposits and floodplain alluvium (Dakota County Maps and Mapping Services, 1990). These are comprised of peat and organic-rich silt and clay; poorly bedded and moderately sorted sediments; and clayey silt soils in the Minnesota River Valley. Bedrock in the Project area is part of the Prairie Du Chien Group, which is comprised of Dolostone of the Shakopee Formation and Oneota Dolomite. The upper layer is commonly thin bedded and sandy or oolitic; the lower part is massive to thick bedded and not sandy or oolitic (Dakota County, 1990). Depth to bedrock in the Project area is typically less than 100 feet.

Based on the Natural Resource Conservation Service ("NRCS") Soil Survey of Dakota County (U.S. Department of Agriculture ("USDA"), 1980), the most predominant soils in the Project area include the following soils series types: Udorthents, wet (1027); Kalmarville sandy loam (465); Oshawa silty clay loam (317); Faxon silty clay loam (408); Minneiska loam (463); Algansee sandy loam (1821) (*see* **Figure B-15**). The soil series crossed by the Project are defined by the NRCS as ranging from "somewhat poorly drained" to "very poorly drained".

Soils along the Proposed Route are typically competent mineral soils with little evidence of hydric conditions in the soil profile. Soils along the Alternative Route Segment are dominated by fairly thick peat deposits. Moreover, the soils in this area are dominated by groundwater discharge characteristics in the soil profile (*see* Section 4.3)

6.2 Human Settlement

The current land use between Black Dog Substation and I-35W within the Project area is industrial, forested, and open lands, and includes existing road and utility corridors. The Project area is surrounded by lands managed by the USFWS as part of the Minnesota Valley NWR and consists largely of wetlands and a waterbody (Black Dog Lake). Between I-35W and Savage Substation, the Project area consists largely of commercial/industrial lands. Specifically, the

Project will be located within and adjacent to an active sand and gravel mine and adjacent to an active landfill. No residential properties are located within 1,000 feet of the centerline of the Proposed Route.

The rebuild portion of the Project is generally located along an existing road right-of-way. As a result, none of the Project-related activities represent any changes in land use or displace other land uses because the rebuilt transmission lines will mostly occur within developed linear corridors.

Mitigative Measures

There are no anticipated changes to the distribution or demand for resources such as groundwater or surface water that could affect other economic activities. Tourism activities are not dependent on the site or its immediate environs, and therefore are unlikely to be increased or decreased as a result of the Project. No mitigative measures are proposed.

6.2.1 Zoning and Displacement

There are no homes within 1,000 feet of the Proposed Route Centerline. The Proposed Route will cross areas classified by the City of Burnsville's Zoning Map data (2009) as Conservancy and General Industrial districts (**Figure B-16**). This area also appears to be subject to a Shoreland overlay district, as well as a FW-Floodway overlay district and FF-Flood Fringe overlay district. Electric transmission is defined as an essential service City of Burnsville's City Code § 10-4-2. Pursuant to City Code § 10-28-3, utility uses are a conditionally permitted use within the CD-Conservancy zoning district and utility transmission lines are specifically referenced as a conditionally permitted use within the FW-Floodway overlay district.

Mitigative Measures

Because no residential or business displacement will occur, no mitigative measures relating to displacement are proposed. With respect to City of Burnsville zoning ordinances, the Company will seek to construct the facilities consistent with any applicable zoning ordinances. However, no zoning, building or land use approvals will be required from the City of Burnsville if a Route Permit is issued for the Project. Once the Commission issues a Route Permit, zoning, building, and land use regulations and rules are preempted per Minnesota Statutes Section 216E.10, subdivision 1.

6.2.2 Public Health and Safety

The Project will be designed in compliance with local, state, NESC, and Xcel Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and right-of-way widths. Xcel Energy construction crews and/or contract crews will comply with local, state, NESC, and Xcel Energy standards regarding installation of facilities and standard construction practices. Established Company and industry safety procedures will be followed during and after installation of the transmission lines. This will include clear signage during all construction activities.

The proposed transmission lines will be equipped with protective devices to safeguard the public from the transmission lines if an accident occurs, such as a structure or conductor falling to the ground. The protective devices include breakers and relays located where the line connects to the substation(s). The protective equipment will de-energize the line should such an event occur. Proper signage will be posted to warn the public of the risk of coming into contact with the energized equipment.

Electric and Magnetic Fields

Considerable research has been conducted throughout the past three decades to determine whether exposure to power-frequency (60 hertz) magnetic fields causes biological responses and health effects. Epidemiological and toxicological studies have shown no statistically significant association or weak associations between MF exposure and health risks. Public health professionals have also investigated the possible impact of exposure to EMF upon human health for the past several decades. While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields can cause biological responses or health effects continues to be debated.

In 1999, the National Institute of Environmental Health Sciences ("NIEHS") issued its final report on "Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields" in response to the Energy Policy Act of 1992. The NIEHS concluded that the scientific evidence linking MF exposures with health risks is weak and that this finding does not warrant aggressive regulatory concern. However, because of the weak scientific evidence that supports some association between MFs and health effects and the common exposure to electricity in the United States, passive regulatory action, such as providing public education on reducing exposures, is warranted.

In 2007, the World Health Organization ("WHO") concluded a review of the health implications of electromagnetic fields. In this report, the WHO stated:

> Uncertainties in the hazard assessment [of epidemiological studies] include the role that control selection bias and exposure misclassification might have on the observed relationship between magnetic fields and childhood leukemia. In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern. (*Environmental Health Criteria Volume No. 238 on Extremely Low Frequency Fields* at p. 12, WHO (2007)).

Also, regarding disease outcomes, aside from childhood leukemia, the WHO stated that:

> A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence

> is sufficient to give confidence that magnetic fields do not cause the disease. (*Id.* at p. 12.)

Furthermore, in their "Summary and Recommendations for Further Study" WHO emphasized that:

> The limit values in [ELF-MF] exposure guidelines [should not] be reduced to some arbitrary level in the name of precaution. Such practice undermines the scientific foundation on which the limits are based and is likely to be an expensive and not necessarily effective way of providing protection. (*Id.* at p. 12).

Although WHO recognized epidemiological studies indicate an association on the range of three to four mG, WHO did not recommend these levels as an exposure limit but instead provided: "The best source of guidance for both exposure levels and the principles of scientific review are international guidelines." *Id.* at pp. 12-13. The international guidelines referred to by WHO are the International Commission on Non-Ionizing Radiation Protection ("ICNIRP") and the Institute of Electrical and Electronic Engineers ("IEEE") exposure limit guidelines to protect against acute effects. *Id.* at p. 12. According to WHO, ICNIRP is a "non-governmental organization in formal relations with WHO." *Id.* at p. xii. The ICNIRP-1998 continuous general public exposure guideline is 833 mG and the IEEE continuous general public exposure guideline in 9,040 mG. In addition, WHO determined that "the evidence for a casual relationship [between ELF-MF and childhood leukemia] is limited, therefore exposure limits based on epidemiological evidence is not recommended, but some precautionary measures are warranted." *Id.* at p. 355-56.

WHO concluded that:

> given both the weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia, and the limited impact on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus, the costs of precautionary measures should be very low . . . . Provided that the health, social and economic benefits of electric power are not compromised, implementing very low-cost precautionary procedures to reduce exposure is reasonable and warranted. (*Id.* at p. 13).

In 2010, ICNIRP revised its continuous general public exposure guideline by increasing it from 833 mG to 2,000 mG. The WHO has not provided any analysis of the ICNIRP-2010 continuous general public exposure guideline to date.

Wisconsin, Minnesota and California have all conducted literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group ("Working Group") to evaluate the body of research and develop policy recommendations to protect the public health from any potential problems resulting from HVTL (High Voltage Transmission Lines) EMF effects. The Working Group consisted of staff from various state agencies and published its findings in a White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options in September 2002, (Minnesota Department of Health, 2002). The report summarized the findings of the Working Group as follows:

Research on the health effects of EMF has been carried out since the 1970s. Epidemiological studies have mixed results – some have shown no statistically significant association between exposure to EMF and health effects, some have shown a weak association. More recently, laboratory studies have failed to show such an association, or to establish a biological mechanism for how magnetic fields may cause cancer. A number of scientific panels convened by national and international health agencies and the United States Congress have reviewed the research carried out to date. Most researchers concluded that there is insufficient evidence to prove an association between EMF and health effects; however, many of them also concluded that there is insufficient evidence to prove that EMF exposure is safe. (*Id.* at p. 1.)

The Public Service Commission of Wisconsin ("PSCW") has periodically reviewed the science on MFs since 1989 and has held hearings to consider the topic of MF and human health effects. The most recent hearings on MF were held in July 1998. Recently, January 2008, the PSC published a fact sheet regarding MFs. In this fact sheet the PSC noted that:

> Many scientists believe the potential for health risks for exposure to EMF is very small. This is supported, in part, by weak epidemiological evidence and the lack of a plausible biological mechanism that explains how exposure to EMF could cause disease. The magnetic fields produced by electricity are weak and do not have enough energy to break chemical bonds or to cause mutations in DNA. Without a mechanism, scientists have no idea what kind of exposure, if any, might be harmful. In addition, whole animal studies investigating long-term exposure to power frequency EMF have shown no connection between exposure and cancer of any kind. *(EMF-Electric & Magnetic Fields, PSC (January 2008)).*

The Minnesota Public Utilities Commission, based on the Working Group and World Health Organization findings, has repeatedly found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects." *In the Matter of the Application of Xcel Energy for a Route Permit for the Lake Yankton to Marshall Transmission Line Project in Lyon County*, Docket No. E-002/TL-07-1407, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Xcel Energy for the Lake Yankton to Marshall Transmission Project at p. 7-8 (Aug. 29, 2008); *See also*, *In the Matter of the Application for a HVTL Route Permit for the Tower Transmission Line Project*, Docket No. ET-2, E015/TL-06-1624, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Minnesota Power and Great River Energy for the Tower Transmission Line Project and Associated Facilities at p. 23 (Aug. 1, 2007)("Currently, there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects.").

The Commission again confirmed its conclusion regarding health effects and MFs in the Brookings County – Hampton 345 kV Route Permit proceeding ("Brookings Project"). In the Brookings Project Route Permit proceeding, Applicants Great River Energy and Xcel Energy and one of the intervening parties provided expert evidence on the potential impacts of electric and magnetic fields on human health. The ALJ in that proceeding evaluated written submissions and a day-and-half of testimony from these two expert witnesses. The ALJ concluded: "there is no demonstrated impact on human health and safety that is not adequately addressed by the existing State standards for [EF or MF] exposure." *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Docket No. ET-2/TL-08-1474, ALJ Findings of

Fact, Conclusions and Recommendation at Finding 216 (April 22, 2010 and amended April 30, 2010). The Commission adopted this finding on July 15, 2010. *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Docket No. ET-2/TL-08-1474, Order Granting Route Permit (September 14, 2010).

Stray Voltage

There is a potential for vehicles under high voltage transmission lines to build up an electric charge. If this occurs, the vehicle can be grounded by attaching a grounding strap to the vehicle long enough to touch the earth. Such buildup is a rare event because generally vehicles are effectively grounded through tires. Modern tires provide an electrical path to ground because carbon black, a good conductor of electricity, is added when they are produced. Metal parts of farming equipment are frequently in contact with the ground when plowing or engaging in various other activities. Therefore, vehicles will not normally build up a charge unless they have unusually old tires or are parked on dry rock, plastic, or other surfaces that insulate them from ground.

Buildings are permitted near transmission lines but are generally prohibited within the right-of-way itself because a structure under a line may interfere with safe operation of the transmission facilities. For example, a fire in a building on the right-of-way could damage a transmission line. As a result, NESC guidelines establish clear zones for transmission facilities. Metal buildings may have unique issues. For example, metal buildings near power lines of 200 kV or greater must be properly grounded. Any person with questions about a new or existing metal structure can contact the Company for further information about grounding requirements.

Mitigative Measures

Xcel Energy does not anticipate any adverse public health and safety impacts from the Project. Therefore, no mitigative measures are proposed.

6.2.3 Noise

Transmission conductors produce noise under certain conditions. The level of noise depends on conductor conditions, voltage level and weather conditions. Generally, activity-related noise levels during the operation and maintenance of transmission lines are minimal.

Noise emissions from a transmission line occur during certain weather conditions. In foggy, damp, snowy or rainy weather, power lines can create a crackling sound when a small amount of electricity ionizes the moist air near the wires. During heavy rain, the background noise level of the rain is usually greater than the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain. Noise levels produced by a 115 kV transmission line are generally less than outdoor background levels and are therefore not usually audible.

In Minnesota, statistical sound levels (L Level Descriptors) are used to evaluate noise levels and identify noise impacts. The L5 is defined as the noise level exceeded 5% of the time, or for

three minutes in an hour. The L50 is the noise level exceeded 50% of the time, or for 30 minutes in an hour.

Land areas, such as picnic areas, churches, or commercial spaces, are assigned to an activity category based on the type of activities or use occurring in the area. Activity categories are then categorized based on their sensitivity to traffic noise. The Noise Area Classification ("NAC") is listed in the MPCA noise regulations to distinguish the categories.

Table 11 below identifies the MPCA established daytime and nighttime noise standards by NAC. The standards are expressed as a range of permissible dBA within a one hour period; L_{50} is the dBA that may be exceeded 50 percent of the time within an hour, while L_{10} is the dBA that may be exceeded 10 percent of the time within the hour. **Table 12** shows noise levels at the edge of the right-of-way at various voltages showing that the noise levels will be well within MPCA guidelines.

Table 11 - Noise Standards by Noise Area Classification

Noise Area Classification	Daytime		Nighttime	
	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Table 12 - Calculated Audible Noise (dBA) for Proposed Single Pole 115 kV Single and Double Circuit Transmission Line Design (3.28 feet above ground)

Structure Type	Noise L_5 (Edge of Right-of-Way) (Decibels a weighted)	Noise L_{50} (Edge of Right-of-Way) (Decibels a weighted)
Single Pole Y-Frame 115 kV Single Circuit	15.8	12.3
Single Pole Delta 115 kV/115kV Double Circuit	16.7	13.2
Single Pole Davit Arm 115 kV/115kV Double Circuit	18.3	14.8
Note: Noise calculations done using the EPRI Enviro software and the BPA standard method of calculation.		

Noise will be generated by the construction of the Project. Construction noise will be predominantly intermittent sources originating from diesel engine driven construction equipment. Potential noise impacts will be mitigated by proper muffling equipment fitted to construction equipment and restricting activities if necessary.

Mitigative Measures

The noise generated from the transmission lines is not expected to exceed background noise levels and will, therefore, not be audible at any receptor location. Transmission conductors and transformers at substations can produce noise when it is foggy, damp, or rainy, including a subtle cracking or humming noise. The transmission lines and substations are designed and constructed to comply with state noise standards established by the MPCA. Any audible noise will be below the MPCA noise standards established for Noise Area Classification ("NAC") 1. Additionally, it is not anticipated that the Project will increase noise from transmission line conductors or any associated facilities above the levels already experienced by the existing 0844 and 0861 transmission lines. Therefore, no mitigation is required for the audible noise generated by the proposed transmission lines.

6.2.4 Television and Radio Interference

Corona from transmission line conductors can generate electromagnetic "noise" at the same frequencies that radio and television signals are transmitted. This noise can cause interference with the reception of these signals depending on the frequency and strength of the radio and television signal. Tightening loose hardware on the transmission line usually resolves the problem.

If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations previously providing good reception can be restored by appropriate modification of (or addition to) the receiving antenna system. AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the right-of-way to either side.

FM radio receivers usually do not pick up interference from transmission lines because corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88-108 Megahertz) and the excellent interference rejection properties inherent in FM radio systems make them virtually immune to amplitude type disturbances

A two-way mobile radio located immediately adjacent to and behind a large metallic structure (such as a steel tower) may experience interference because of signal-blocking effects. Movement of either mobile unit so that the metallic structure is not immediately between the two units should restore communications. This would generally require a movement of less than 50 feet by the mobile unit adjacent to a metallic tower.

Television interference is rare but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. Loose and/or damaged hardware may also cause television interference. If television or radio interference is caused by or from the operation of the proposed facilities in those areas where good reception is presently obtained, the Company will inspect and repair any loose or damaged hardware in the transmission line, or take other necessary action to restore reception to the pre-Project level, including the appropriate modification of receiving antenna systems if deemed necessary.

Mitigative Measures

The Project is not expected to cause radio and television interference. However, if radio or television interference occurs because of the transmission line, Xcel Energy will work with the affected parties to restore reception to pre-Project quality.

6.2.5 Public Service and Infrastructure

The City of Burnsville provides water and sewer service to its residents. No impacts on public services are anticipated to occur as a result of the proposed Project.

Mitigative Measures

No impacts on public services are anticipated to occur as a result of the proposed Project. Therefore, no mitigative measures are proposed.

6.2.6 Socioeconomics

According to U.S. Census Bureau data, minority groups in the area constitute a very small percentage of the total population, averaging 11.8 percent. Per capita incomes within the county and nearest cities to the Project area are higher than the State of Minnesota average per capita income. The percentage of persons living below the poverty level in the area is approximately 50 percent less than the State average. The area does not contain disproportionately high minority populations, low-income populations, or high percentages of persons living below the poverty level. Population and economic characteristics based on the 2000 U.S. Census are presented in **Table 13.**

Table 13 – Population and Economic Characteristics

Location	Population	Minority Population (Percent)	Caucasian Population (Percent)	Per Capita Income	Percentage of Individuals Below Poverty Level
State of Minnesota	5,303,925[a] (2010)	11.4 (2009)[b]	88.6 (2009)[b]	$23,198 (1999)[b]	9.6 (2008)[b]
Dakota County[c]	396,500 (2009)	11.4 (2009)	88.6 (2009)	$27,008 (1999)	4.6 (2008)
City of Burnsville	59,135 (2009)[d]	12.5 (2000)[e]	87.5 (2000)[e]	$27,098 (1999)[e]	5.1 (1999)[e]
City of Eagan	64,186 (2009)[f]	12.0 (2000)[g]	88.0 (2000)[g]	$30,167 (1999)[g]	2.9 (1999)[g]

Sources:

[a] U.S. Census Bureau, 2010a.

[b] U.S. Census Bureau, 2010b.

[c] U.S. Census Bureau, 2010c.

[e] U.S. Census Bureau, 2010d.
[d] U.S. Census Bureau, 2010e.
[f] U.S. Census Bureau, 2010f.
[g] U.S. Census Bureau, 2010g.

Approximately 15 to 25 workers will be required for the transmission line construction and removal of existing lines. Approximately six months to a year will be required to construct all aspects of the Project. During construction, crews will spend money locally, thereby providing a small economic benefit to the community. There will be short-term impacts to community services as a result of construction activity and an influx of contractor employees during construction of the various segments of the Project. Both utility personnel and contractors will be used for construction activities. It is not expected that additional permanent jobs will be created by the Project.

Mitigative Measures

Xcel Energy does not anticipate any adverse socioeconomic impacts from the Project. The Project will result in a slight influx of wages and expenditures made at local businesses during construction. Once the Project is operational, its socioeconomic effects are generally positive because it will provide a more stable and reliable supply of electricity, encourage business development, provide for future growth, and increase the local tax base resulting from the incremental increase in revenues from utility property taxes. Therefore, no mitigative measures are proposed.

6.2.7 Cultural Values

Cultural values include those perceived community beliefs or attitudes in a given area, which provide a framework for community unity. The region surrounding the Project area has cultural values tied to the area's strong German, Norwegian, and Irish heritage (ePodunk, 2010a), and the manufacturing, retail trade, finance and insurance, and professional, scientific, and technical services economies (ePodunk, 2010b). Local community ties relate to work, worship, celebration, and recreation. An example of area culture and industry include the annual Dakota County Fair, held annually in August in Farmington (Minnesota Federation of County Fairs, 2010).

Mitigative Measures

Construction of the proposed Project is not expected to conflict with the cultural values along the site. No impacts on cultural values are anticipated; therefore, no mitigative measures are proposed.

6.2.8 Recreation

There are three formal recreational areas located near the Project area: the Minnesota Valley NWR, Cliff Fen Park, and Black Dog Park (City of Burnsville, 2011b, 2011c) (*see* **Figure B-17)**. The Minnesota Valley NWR surrounds the eastern portion of the project, owned by Xcel Energy, where the proposed rebuilding of the transmission lines will be located. Dakota County is also home to several other parks, city trails, and general recreational areas; however, they are

located within densely populated residential areas not in the direct vicinity of the Project area. Primary tourism activities in the region include camping, recreational use of lakes for fishing and boating, bicycling, hiking, bird or wildlife viewing, or cross country skiing.

The majority of the remaining property (1,250 acres) is managed as part of the Minnesota Valley NWR under a 1982 lease and agreement with the USFWS. Established in 1976, the Minnesota Valley NWR stretches over 50 miles between Fort Snelling State Park and Belle Plaine, Minnesota, and provides habitat for a large number of migratory waterfowl, fish, and other wildlife species (USFWS, 2011a). The Refuge offers a variety of year-long and free outdoor recreational activities, and has two education and visitors centers, which are located over 5 and 40 miles, respectively, from the Project site. The Minnesota Valley NWR is well known for bird watching, which is available year-round. Other recreational opportunities include wildlife observation, wildlife photography, hunting, fishing, environmental education, and interpretation. According to the USFWS' website (2011), overall management of the Refuge involves "restoring wetlands, grasslands, and oak savannas, enhancing aquatic plant diversity through water level management, grassland management, exotic species control, and water quality monitoring."

The City of Burnsville is also contemplating a potential bike trail to be constructed along Black Dog Road (*see* **Figure 8**). Also, a limestone quarry reclamation plan is planned west of I-35W (*see* **Figure B-9**), which includes the potential construction of a city park, golf course, and riverfront park near the Proposed Route. If constructed along the Proposed route, the Project will relocate the existing 115 kV transmission line facilities from the limestone quarry**Mitigative Measures**

Xcel Energy plans to work with the USFWS and other appropriate representatives to minimize impacts to recreational use in the Minnesota Valley NWR that may result during construction of the Project. Xcel Energy will also work closely with the City of Burnsville to mitigate impacts to the potential bike trail and recreational features that may be constructed as part of its limestone quarry reclamation plan.

6.2.9 Aesthetics

As construction of the proposed transmission line will occur adjacent to existing road rights-of-way, as well as within an area already populated by transmission lines and structures, the rebuild portion of the Project will have nominal effects on the visual and aesthetic character of the area. The proposed structures for the 115 kV double circuit transmission line will be similar to the other 115 kV transmission lines used on the Xcel Energy system and in the area. The structures will be between 50 and 100 feet tall and will have an average span between 500 and 800 feet. The finish of the proposed poles will be weatherized or galvanized steel. The proposed steel poles will give the new transmission line a somewhat more modern appearance. The conductor will be 795 KCmil 26/7 ACSS or a conductor of equivalent capacity (*see* **Section 5.1.1**).

Like the existing transmission lines in the area, the new rebuilt transmission line may be visible to some area residents and users of a planned bike trail on or along Black Dog Road. The majority of the landscape in the area is commercial/industrial but bordered by a wildlife and recreational area as well as residences. The visual effect will depend largely on the perceptions of the observers. Much of the residential groupings in the area are on top of cliffs overlooking the Minnesota River Valley. The visual contrast added by the transmission structures and lines

may be perceived as a visual disruption or as points of visual interest. The transmission lines that already exist in the Project area will limit the extent to which the new lines are viewed as a disruption to the area's scenic integrity. Xcel Energy is also planning to remove the existing transmission lines that cross Black Dog Lake within the Minnesota River Valley NWR; therefore, the Project will result in reduced visual impacts.

Mitigative Measures

Removing two existing H-frame, single circuit 115 kV transmission lines that cross Black Dog Lake, and replacing the lines with the single-pole, double circuit transmission lines as proposed, will consolidate the lines and thereby improve the overall aesthetics in the area. Xcel Energy will continue to work with affected parties to identify additional methods, if necessary, to further mitigate aesthetical impacts related to the proposed Project.

6.2.10 Traffic

Several roads serve the Project area. The first is East Black Dog Road which runs between the Minnesota River and the northern border of Black Dog Lake and, from Xcel Energy's Black Dog Plant entrance, extends west approximately 1.2 miles before becoming West Black Dog Road. West Black Dog Road continues west for approximately 0.8 mile, at which point it intersects with Cliff Road. Currently, West Black Dog Road is closed due to access issues. The project crosses I-35W and once again intersects with West Black Dog Road turning into Chower Avenue South, which runs along the property line between the sand and gravel pit and the landfill. The rebuild Project route turns south from Chower Avenue and runs approximately 0.6 mile adjacent to 126th Street West to where the new lines intersect with two existing 115 kV transmission lines.

The nearest county road or state highway to the Project area is State Highway 13, which is about 0.8 mile south. Annual Average Daily Traffic ("AADT") on State Highway 13 is 25,500 vehicles (MnDOT, 2009) (see **Figures B-18 and B-19**). AADT on these local roadways average about 2,000 vehicles.

Mitigative Measures

Minimal to no impacts on traffic levels or transportation are anticipated to occur as a result of the proposed Project. During the Project traffic will be increased for equipment deliveries and construction personnel. Xcel Energy will work closely with the MnDOT to address Project-related concerns and to obtain necessary permits and approvals.

6.3 Land-Based Economics

6.3.1 Agriculture

The Project area is not located in an agricultural area. Based on recent aerial photographs, the nearest significant tracts of land with evidence of agriculture are south of the City of Apple Valley, approximately 6 miles from the Project.

Mitigative Measures

The Project area is not located in an agricultural area; therefore, no mitigative measures are proposed.

6.3.2 Forestry

Based on property parcel data, no economically significant forestry resources are located within the Project area.

Mitigative Measures

No economically significant forestry resources are located within the Project area; therefore, no mitigative measures are proposed.

6.3.3 Mining

According to the MnDOT county pit map for Dakota County, USGS topographic maps, and aerial images, there is a rock quarry in the vicinity of the Project (MnDOT, 2001). As previously stated, the Project will remove the existing transmission lines that cross an active rock quarry, thereby providing the landowner with additional space to conduct mining operation and be consistent with future plans for the mining property.

Mitigative Measures

Since the Project will result in an overall benefit to local mining operations, no mitigative measures are proposed.

6.3.4 Tourism

The primary tourism activities in the region include camping, recreational use of lakes for fishing and boating, bicycling, hiking, bird or wildlife viewing, or cross country skiing. The Minnesota Valley NWR and various parks located along the Mississippi River represent the major tourism resources in the general vicinity of the Project. As discussed in **Section 6.2.8**, the Minnesota Valley NWR offers a variety of year-long and free outdoor recreational activities, and has two education and visitors centers, which are located over 5 and 40 miles, respectively, from the Project site. Due to the respective distances away from the proposed Project, effects on these tourism resources can easily be avoided during construction and operation or the proposed transmission line.

Mitigative Measures

A short-term impact on tourism activities may occur during construction of the Project Minnesota Valley NWR. However, after construction activities are complete, it is unlikely that tourism activities will be increased or decreased as a result of the Project. Xcel Energy will work with the USFWS and other appropriate representatives to minimize impacts on tourism areas within the Minnesota Valley NWR that may result during construction of the Project.

6.3.5 Commercial and Residential

The Project area is segregated from commercial and residential areas by Black Dog Lake, the Union Pacific Railroad and Black Dog Park. The closest commercial structure is an industrial business near the terminus of the Project, which is about 0.2 mile south of the proposed transmission line connection with the existing 115 kV transmission lines.

Mitigative Measures

No commercial or residential properties will be impacted by the proposed Project; therefore, no mitigative measures are proposed for commercial and residential areas.

6.4 Archaeological and Historical Resources

On behalf of Xcel Energy, Merjent, Inc. conducted Phase Ia background research/literature review for the Project in December of 2010 at the Minnesota State Historic Preservation Office ("SHPO") (*see* **Appendix E**). The review identified three archaeological sites and no inventoried historic architectural properties located within one mile of the Project area (*see* **Figure B-20** and **Table 14**). Two of the archaeological sites are mound sites, confirmed as burials by excavation. Site 21DK0041, which was dated to the prehistoric Arvilla Complex (AD 500-900), was completely destroyed by residential development in the 1960s. Site 21HE0016 was first recorded in the 1890s as two mounds located on the east side of a village. The Minnesota Archaeological Society excavated at the site in 1946; photos show early historic artifacts with the burials, but provide no further information. When construction for a housing development was underway in 1968, a burial was discovered and salvaged at this location. The site is considered destroyed by modern development.

The third archaeological site is a prehistoric artifact scatter dating to the Dakota occupation of the river valley. This site (21HE0228) is on the river bluff's edge, and was discovered during a 2006 survey for a recreational trail.

Table 14 – Previously Identified Historic Properties Near The Project

Type of Historic Property	Inventory Number	Description	NRHP Status
Archaeological	21HE0016	Prehistoric or Contact Period mound site	N/A
Archaeological	21DK0041	Prehistoric Arvilla Complex mound site (destroyed)	N/A
Archaeological	21HE0228	Prehistoric or Contact Period artifact scatter	Unevaluated
Architectural	N/A	Union Pacific Railroad	Potentially eligible

The only historic architectural property within one mile of the Project area is the Union Pacific Railroad, which runs along the southern edge of the Minnesota River Valley. This rail line between St. Paul and Mankato, which was first built in 1864, represents the early expansion of Minnesota and the transportation network that helped bring the state's agricultural products to the marketplace. A Multiple Property Nomination to the NRHP for Railroads in Minnesota 1862-1956 (Schmidt et al., 2002) establishes the criteria for NRHP eligibility for railroad properties. Although the Union Pacific Railroad is not specified as eligible for listing on the NRHP, it does meet the criteria and should be considered potentially eligible.

The archaeological sites identified are located outside the Proposed Route as shown in **Figure B-20** and will not experience direct impacts resulting from the construction of this Project. Site 21DK0041 is not extant. Sites 21HE0016 and 21HE0228 are located on the river bluff more than one-half mile north of the Project area. A segment of the Union Pacific Railroad, the only recorded property potentially eligible for listing on the NRHP, skirts the Project area to the south, and intersects it on the western end. The Project will not adversely affect the historic integrity or setting of the railroad at this location. The proposed construction will expand the existing infrastructure area and the resulting landscape will not be substantially changed.

A Phase IA literature review report, which presented the findings summarized here, was submitted to Minnesota SHPO on March 18, 2011. In an April 20, 2011 letter, SHPO concurred with the report's recommendation of no adverse effects on known or suspected archaeological properties. See Appendix C for the SHPOs concurrence letter.

Mitigative Measures

No mitigative measures are indicated for cultural resources within the Project area. No known property listed or eligible for listing on the NRHP or the Minnesota Register of Historic Sites is within the Project area. As stated above, the Phase Ia report and its recommendations have been reviewed by the Minnesota SHPO. Should a specific impact be identified, Xcel Energy will consult with SHPO regarding the site's potential NRHP eligibility and appropriate mitigation measures.

If there is an unanticipated discovery of cultural resources during Project construction, Xcel Energy will stop construction activities in the area of the discovery and consult with a professional archaeologist and Minnesota SHPO to determine the proper course of action. If a cultural item or feature is determined to be potentially eligible for listing on the NRHP, it will be avoided or mitigated before construction resumes.

6.5 Natural Environment

6.5.1 Air Quality

Potential air quality effects related to transmission facilities include fugitive dust emissions during construction, exhaust emissions from construction equipment, and ozone generation during transmission line operation (Jackson et al., 1994). All of these potential effects are considered to be relatively minor, and all but the ozone effects are short-term.

State and federal governments currently regulate permissible concentrations of ozone and nitrogen oxides. Ozone forms in the atmosphere when nitrogen oxides and volatile organic compounds react in the presence of heat and sunlight. Air pollution from cars, trucks, power plants, and solvents contribute to the concentration of ground-level ozone through these reactions. Currently, both state and federal governments regulate permissible concentrations of ozone and nitrogen oxides. The national standard is 0.075 parts per million ("ppm") during an 8-hour averaging period. The state standard is 0.08 ppm based upon the fourth-highest 8-hour daily maximum average in one year.

The only potential air emissions from a transmission line result from corona, and such emissions are limited. Corona consists of the breakdown or ionization of air within a few centimeters immediately surrounding conductors and can produce ozone and oxides of nitrogen in the air surrounding the conductor. This process is limited because the conductor electrical gradient of a 115 kV transmission line is usually less than that necessary for the air to break down. Typically, some imperfection such as a scratch on the conductor or a water droplet is necessary to cause corona.

Ozone is not only produced by corona, but also forms naturally in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight and inversely proportional to humidity. Thus, humidity (or moisture), the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short-lived. Dakota County is currently listed as a designated nonattainment county for one NAAQS Pollutant (U.S. Environmental Protection Agency, 2011).

During construction of the proposed transmission line, minor emissions from vehicles and other construction equipment and fugitive dust from right-of-way clearing will occur, but will be limited. Air-quality impacts during the construction phase will also be temporary.

The magnitude of construction emissions is heavily influenced by weather conditions and the specific construction activity. Exhaust emissions, primarily from diesel equipment, will vary according to the phase of construction, but will be minimal and temporary. Adverse impacts on the surrounding environment will be minimal because of the short and intermittent nature of the emission and dust-producing construction phases.

Mitigative Measures

Xcel Energy will employ BMPs to minimize the amount of fugitive dust created by the construction process. Tracking control at access roads and wetting surfaces are examples of BMPs that will be used to minimize fugitive dust. Based upon this, Xcel Energy anticipates no significant effects to air quality from the Project; therefore, no mitigative measures are proposed.

6.5.2 Waterbodies

The Project area is located within and surrounded by significant surface water features that include the Minnesota River and Black Dog Lake (see **Figure B-14**). These waterbodies are classified by the MnDNR as Minnesota public water basins and watercourses that meet the criteria set forth in Minnesota Statutes Section 103G.005, subdivision 15 and are identified on PWI maps authorized by Minnesota Statutes Chapter 103G.

The majority of the Project area is located in a Zone A20, or 100 year, floodplain (FEMA, 1977). A small portion of the project, however, is located in a Zone B, or 500 year, floodplain.

The Project is located within Black Dog Lake – Minnesota River minor watershed (MnDNR, 2011c) (see **Figure B-21.**). A watershed is defined as the entire physical area or basin drained by a distinct stream or riverine system, physically separated from other watersheds by ridgetop boundaries (MnDNR, 2011c). As part of the Metropolitan Surface Water Management Act, the Black Dog Watershed Management Organization ("BDWMO") was formed in the Project area (BDWMO, 2011). Watershed management overseen by the BDWMO covers northwestern Dakota County and a portion of northeastern Scott County, Minnesota. The BDWMO contains portions of the cities of Apple Valley, Burnsville, Eagan, Lakeville, and Savage. Surface water in the BDWMO ultimately discharges to the Minnesota River.

The Project may require water resource approvals from the USACE, MnDNR, and City of Burnsville. These agencies administer regulatory programs of the federal Clean Water Act and Rivers and Harbors Act, the Minnesota Public Water Resources Act and Utility Crossing Licenses, and the Minnesota Wetland Conservation Act ("WCA"), respectively. After coordination and application submission, authorization from the USACE would likely fall under its Regional General Permit ("RGP-3-MN")/Letter of Permission ("LOP-05-MN") permitting program.

The MnDNR Division of Waters requires a Public Waters Work Permit for any alteration of the course, current, or cross-section below the ordinary high water level of a PWI water. Public waters are defined as any waterbodies (lakes, rivers, and some wetlands) identified as such on the PWI Maps. MnDNR's rules specify general and specific standards that apply to the evaluation of permits for specific types of activity in PWI waters (Minn. R. 6115.0190). Permission for this work can be obtained by submitting the Minnesota Local/State/Federal Application Form (the "Joint Application Form") for Water/Wetland Projects to the USACE's St. Paul District, MnDNR, and City of Burnsville. The joint application will be subject to MnDNR review for work within public waters.

Separately, Minnesota law (Minnesota Statutes Section 84.415 administered through Minnesota Rules Chapter 6135) requires that a license be obtained from the MnDNR Division of Lands & Minerals for the passage of any utility over, under, or across any state land or public waters. Xcel Energy will work closely with the MnDNR to obtain the necessary licenses for the proposed double circuit lines that cross PWI waters, or modify Xcel Energy's existing licenses currently intact for Transmission Lines 0844 and 0861 to apply to the new lines.

Mitigative Measures

Xcel Energy will design the Project to minimize direct and indirect (e.g., erosion runoff) impacts on public waters to the greatest extent possible. Xcel Energy will apply erosion control measures identified in the MPCA Storm Water Best Management Practices Manual, such as using silt fence to minimize impacts to adjacent water resources. During construction, Xcel Energy will control operations to minimize and prevent material discharge to surface waters. Disturbed surface soils will be stabilized at the completion of the construction process to minimize the potential for subsequent effects on surface water quality.

6.5.3 Wetlands

Wetland areas were initially identified using National Wetlands Inventory ("NWI") data to assess wetlands that may be present within the Project area. NWI data is a reliable source of information for initial wetland identification and assessment. Based on NWI data, most of the Project area east of I-35W is dominated by various wetland types including Palustrine Emergent ("PEM"), Palustrine Scrub Shrub ("PSS"), Palustrine Forested ("PFO"), and Palustrine Unconsolidated Bottom ("PUB"). The PWI also identifies protected wetlands, of which three surround the Project area: the Minnesota River and both segments of Black Dog Lake (*see* **Figure B-21**).

The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergent's, mosses or lichens (Cowardin et al. 1979). Of those wetlands, the majority contains emergent vegetation with some displaying a mixture of shrubs and herbaceous vegetation, while a few have no vegetation and contain unconsolidated bottoms. Lacustrine wetland systems are found in the shallow protected areas of lakes with water depth in the deepest part of the wetland basin greater than 6.6 feet. The areas intersected by the Proposed Route do not appear to be as deep as 6.6 feet, but they are included as part of the same basin.

A wetland delineation and site assessment performed June 16 and June 23-24 evaluated and documented wetland conditions along the Proposed Route. A formal delineation evaluated the components of the route from its start at the Black Dog Power Plant to the crossing with I-35W. Wetland conditions were also assessed during a walkover of the Proposed Route west of I-35W. **Figure B-22** shows field verified wetlands and **Table 15** summarizes the wetlands located within a 100-foot-wide easement and 400- to 750-foot-wide route width associated with the Proposed Route.

Table 15 – Wetlands Within the Proposed Route

Wetland Type [a]	Wetland Area - West of I-35W (acres)[c]		Wetland Area - East of I-35W (acres)[b]	
	400-ft-wide Route Width	100-ft-wide Easement Width	750-ft-wide Route Width	100-ft-wide Easement Width
PFO	--	--	60.6	9.9
PSS	--	--	--	--
PEM	7.9	2.6	70.8	16.7
PEM/PSS	--	--	0.3	<0.1
PUB	3.8	1.2	54.6	4.9
Total	11.7	3.8	186.3	31.5

[a] Based on the USFWS' Cowardin Classification System for wetlands. Wetland types include: PEM – Palustrine Emergent, PFO Palustrine Forested, PSS – Palustrine Shrub-Scrub, PUB – Palustrine Unconsolidated Bottom.

[b] Wetland acreages based on field verified and delineated wetlands.

[c] Wetland acreages based on National Wetland Inventory data.

The wetlands crossed by the Proposed Route are subject to jurisdiction of the USACE under Section 404 of the Clean Water Act and current guidance regarding the jurisdictional status of isolated wetlands. Once the route is finalized and permitting requirements determined, Xcel Energy will submit the Joint Application Form to the USACE's St. Paul District, MnDNR, and City of Burnsville. Application materials will include information necessary for the USACE to make its jurisdictional determination for impacted wetlands. Xcel Energy has met with the USACE about the Project and anticipates the Project will be authorized under the USACE's GP-033-MN or LOP-05-MN permitting program.

Additionally, a public waters work permit may be required from the MnDNR for work affecting the course, current, or cross-section of public waters, including public waters wetlands. "Public waters wetlands" means all types 3, 4, and 5 wetlands, as defined in USFWS Circular No. 39 (1971 edition), not included within the definition of public waters, that are 10 or more acres in size in unincorporated areas or 2-1/2 or more acres in incorporated areas. The process for obtaining such a public waters work permit from the MnDNR using the Joint Application Form is discussed in Section 6.5.2.

The Joint Application Form will also be subject to City of Burnsville review for regulation under the WCA. Xcel Energy is in the process of determining the proposed structures locations and alignment, and is evaluating associated wetland impacts within the Proposed Route corridor. Provided the project does not result in wetland conversion or loss, installation of transmission line structures typically do not meet the definition of permanent fill under WCA; therefore, project activities would be exempt from WCA. Once the proposed structures locations and alignment are finalized, Xcel Energy will work closely with the City of Burnsville to determine the regulatory applicability of WCA to the proposed project.

According to the Clean Water Act, Section 401 water quality certification is required for activities that may result in a discharge to waters of the United States. On non-tribal lands in Minnesota, the MPCA administers Section 401 water quality certification. If the USACE authorizes the Project under its GP/LOP permitting program as expected, the MPCA waives its Section 401 Water Quality Certification authority.

Wetland Delineation and Site Assessment

During the wetland delineation and site assessment performed along the Proposed Route, conditions were wetter than normal during the field investigations. The Minnesota River had multiple flood crests during the months of April, May, and June 2011. The following features summarize the investigation results.

Evaluation of Wetland Conditions West of I-35W

Xcel Energy evaluated wetlands during a walkover of the Proposed Route west of I-35W following the northern and western boundaries of the Quarry. The Proposed Route crosses predominantly upland areas with small pockets of wetlands. The natural wetlands along the Proposed Route have been significantly altered by mining operations. As a result, wetlands west of I-35W are considered as partially drained by mining operations or incidental wetlands resulting from excavation of mine pits and water control ditches.

Wetlands East of I-35W

- The wetland delineation boundary east of I-35W is: (1) the south side of Black Dog Road from the Black Dog Power Plant to the Black Dog Road off-ramp for I-35W, and (2) the midslope position for the Black Dog Road off-ramp embankment, and the mid-slope position for the I-35W embankment to beyond the proposed transmission line crossing of I-35W.
- The Proposed Route follows Black Dog road that sits atop a narrow, natural levee mapped into typically non-hydric, occasionally flooded soils on the levee itself and hydric soils south of the natural levee feature in backswamp locations. Natural levees are convex, depositional landforms that are typically the highest points in a natural floodplain. This levee separates the Minnesota River from historic backswamp deposits that occupied the current bed of the Black Dog Lake reservoir.
- Historic aerial photography from 1937 that is present on the Dakota County web-served GIS shows the entire area that is currently between Black Dog Lake Reservoir and the Minnesota River was cultivated. All natural floodplain forests had been cleared for agricultural use. The photo also indicates that surface water management (e.g., drain tiling) was being performed in the historic bed of the current Black Dog Lake reservoir.
- The areas examined during the June 2011 wetland delineation and site assessment exhibit a prevalence of hydrophytes and several primary indicators of wetland hydrology as indicated in the 1987 Wetland Delineation Manual and more specifically in the draft interim regional supplement. All areas outside of Black Dog Road have hydrophytes and hydrology indicators save a small, approximately two- acre area of historic fill.
- Soils data were not conclusive regarding hydric soil status. However, the soils are considered problem soils (fluvial sediments within floodplains) that would lack hydric

soil indicators due to seasonal and annual deposition of new soil material, sediments with naturally low iron or manganese content, and low organic matter content.

- In the absence of long-term hydrologic data indicating the lack of wetland hydrology, current delineation guidance indicated that the soils be considered hydric in spite of the landscape position and previous soil mapping into a non-hydric soil series.
- All forested and scrub-shrub wetland represents recent regrowth of shrub and floodplain forest species since at least 1937.

Abnormal Wetlands Conditions East of I-35W

The route east of I-35W is indicated on floodplain maps and soils maps as: (1) being occasionally flooded, (2) containing soils that are normally associated with non-wetland natural levee positions, and (3) have a history of agricultural use. Reasons for a return to wetter conditions indicative of jurisdictional wetland within the entire area include:

- Regional agricultural drainage of the Minnesota River has resulted in dramatically increased runoff rates to the river itself, increasing number and duration of flooding events, and increased sediment load. All of these hydrologic factors can change the flooding dynamics of the natural river floodplain to wetter conditions.
- The creation of the Black Dog Reservoir has resulted in a general increase in groundwater levels at all stages of the Minnesota River.

Mitigative Measures

West of I-35W

The most effective way to prevent impacts on wetland areas is to span wetlands to the extent possible, and avoid crossing wetlands with construction equipment. As previously stated, the Proposed Route west of I-35W crosses predominantly upland areas that contain small pockets of wetlands; therefore, it appears that Xcel will be able to successfully span wetlands and avoid wetland travel with construction equipment. Where wetlands must be crossed to pull in the new conductors and shield wires, workers may drive equipment on top of stabilization mats, if soil conditions are saturated and susceptible to rutting.

East of I-35W

The area east of I-35W is predominantly wetland. As a result, spanning and avoiding travel across wetlands east of I-35W is infeasible. Where wetlands will be crossed, workers may drive equipment on top of stabilization mats, if soil conditions are saturated and susceptible to rutting. During winter months, equipment will travel across wetlands under frozen ground conditions; however if saturated, unfrozen areas are present at the time of construction stabilization mats will be used. To further minimize wetland impacts, heavy equipment will travel on Black Dog Road to the greatest extent possible and will use the shortest route when wetland access is unavoidable.

General Mitigative Measures

Xcel will implement construction practices within or near wetland to prevent soil erosion and sedimentation, and will ensure equipment fueling and lubricating will occur a sufficient distance away from wetlands. Xcel Energy will follow standard erosion control measures identified in the MPCA Stormwater Best Management Practice ("BMP") Manual, such as using silt fence to minimize impacts on adjacent water resources.

Practices may include containing excavated material, protecting exposed soil, and stabilizing restored soil. Xcel will work closely with regulatory agencies to establish any additional mitigative measures, if necessary. As previously stated, Xcel will obtain necessary permits and approvals prior to commencing construction.

6.5.4 Floodplain

The proposed Project, east of I-35W, is located within a FEMA-designated flood plain. Flood maps indicate that the Proposed Route is located in an area that only rarely to occasionally floods.

The MnDNR is the state agency with overall responsibility for implementation of the State Flood Plain Management Act. The MnDNR has established minimum standards for floodplain management entitled "Statewide Standards and Criteria for Management of Flood Plain Areas of Minnesota" (Minn. R. 6120.5000 to 6120.6200). These standards have two direct applications: 1) all local floodplain regulations adopted after June 30, 1970 must be compliant with these standards; and 2) all state agencies and local units of government must comply with Minnesota Regulations in the construction of structures, roads, bridges or other facilities located within floodplain areas delineated by local ordinance. Local floodplain regulatory programs, administered by county government, predominately for the unincorporated areas of a county, and by municipal government for the incorporated areas of a county, must be compliant with federal and state floodplain management standards. Both federal and state standards identify the 100-year floodplain as the minimum area necessary for regulation at the local level. These regulations are intended to protect new development and modifications to existing development from flood damages when locating in a flood prone area cannot be avoided (MnDNR, 2011d).

Mitigative Measures

Xcel Energy completed a desktop analysis to evaluate whether further floodplain analysis or modeling would be required. Using a 100-year flood and spreading the displacement attributable to the concrete foundations across the area of the floodplain, it was determined that placing concrete structures within the Minnesota River floodplain would have a negligible effect on flooding potential. Furthermore, since the 500-year floodplain covers a larger area than the 100-year floodplain, the impact would be even less. See **Appendix F**.

Although the project will not result in a negative impact on flood levels; Xcel Energy will work with the MnDNR, City of Burnsville, and/or Dakota County to address question or concerns regarding floodplains.

6.5.5 Wildlife

The waterbodies, open areas, and scattered woodlands in the area provide habitat for a variety of wildlife. The largest mammal typically found in the area is the white-tailed deer. Other mammals include coyotes, fox, raccoons, beaver, opossum, woodchucks, squirrels, and muskrats. Reptiles near the Project area include snapping turtles, map turtles, softshell turtles, painted turtles, gopher snakes, fox snakes, and northern water snakes. Amphibians include leopard frogs, pickerel frogs, spring peeper, and American toads. Fish species vary depending on the type of water body. The most commonly distributed fish species in the waterbodies surrounding the Project area include largemouth bass, sunfish, crappies, northern pike, and multiple species of rough fish such as carp and suckers. Bird species include eagles, turkeys, hawks, pheasants, ducks, herons, and multiple species of song birds.

As previously discussed (*see* **Section 6.2.8**), the Project is located within the Minnesota Valley NWR, which provides habitat for a large number of migratory waterfowl, fish, and other wildlife species. This area provides a good resting area for migratory birds and waterfowl such as long-tailed ducks, American woodcock, Barrow's goldeneyes and Thayer's, and California gulls, in addition to other wintering waterbirds and bald eagles (Wildlife Viewing Areas, 2011). Also, since at least a portion of Black Dog Lake remains open all year due to Xcel Energy's adjacent Black Dog Substation, some birds are able to stay here longer in the winter (USFWS, 2011a).

Because the Project is located within an urban area, the fauna generally present within the area are adapted to high levels of anthropogenic disturbance. Therefore, it is unlikely that the construction, operation, and maintenance of the Project would have a permanent effect on fauna present in the area. Wildlife that inhabits trees that may be removed for the transmission lines will likely be temporarily displaced. Comparable habitat is near the route, and it is likely that these organisms would only be displaced a short distance.

Wildlife that will be affected by construction of the rebuilding of the transmission line will be temporarily displaced to adjacent habitats during the construction process. The majority of construction will be limited to upland areas and, therefore, it is anticipated that impacts on fish and mollusks that inhabit the local waterbodies will be limited to the removal phase of construction where there would be short term disturbance within in Black Dog Lake.

The transmission lines may affect raptors, waterfowl, and other bird species. Birds have the potential to collide with all elevated structures, including power lines. Avian collisions with transmission lines can occur in proximity to agricultural fields that serve as feeding areas, wetlands and water features, and along riparian corridors that may be used during migration.

The electrocution of large birds, such as raptors, is more commonly associated with small distribution lines than large transmission lines. Electrocution occurs when birds with large wingspans come in contact with two conductors or a conductor and a grounding device. Xcel Energy transmission and distribution line design standards provide adequate spacing to eliminate the risk of raptor electrocution and will minimize potential avian impacts of the proposed Project.

It is anticipated that most wildlife displacement and habitat impacts will be temporary.

Mitigative Measures

Xcel Energy has been working with various state and federal agencies for over 20 years to address avian issues as quickly and efficiently as possible. In 2002, Xcel Energy Operating Companies, including Xcel Energy, entered into a voluntary Memorandum of Understanding ("MOU") with the USFWS to work together to address avian issues throughout its service territories. The MOU sets forth standard reporting methods and the development of Avian Protection Plans ("APP") for each state that Xcel Energy serves. APPs include designs and other measures aimed at preventing avian electrocutions, as described in guidance provided by the Avian Power Line Interaction Committee ("APLIC", 2006) and the guidelines for developing APPs (APLIC and USFWS, 2005). The APP for the Minnesota Territory is complete and retrofit actions for areas with potential avian impacts are underway across the territory. Xcel Energy also addresses avian issues related to transmission projects by:

- Working with resource agencies such as the MnDNR and the USFWS to identify areas that may be appropriate for marking transmission line shield wires with bird diverters; and

- Attempting to avoid areas known as primary migration corridors or migratory resting areas.

The conductors on proposed transmission line will be designed to be located in a horizontal configuration instead of a vertical configuration. This design will help mitigate potential avian collisions with the conductors. Additional mitigation measures were designed in the placement of the transmission lines. Instead of crossing directly north of Black Dog Lake, the lines and majority of structures will be placed along the road within the cover of trees where possible. Swan Flight Diverters ("SFDs") will be placed every 40 feet (staggered by 20 feet) on the overhead static lines of the Proposed Route east of I-35W. **Figure 9** below illustrates SFD installation and the approximate alignment which would be utilized for this Project.

Figure 9 – Photo of Swan Flight Diverter Installation

6.6 Rare, Unique or Ecologically Sensitive Resources

6.6.1 U.S. Fish and Wildlife Service

The USFWS's website was reviewed for a list of species covered under the Endangered Species Act ("ESA") that may be present within Dakota County (USFWS, 2011b). According to the website, the following two federally listed species are known to occur within the county: Higgins eye pearlymussel (*Lampsilis higginsii*) and prairie bush-clover (*Lespedeza leptostachya*).

The Higgins eye pearlymussel is listed as endangered and occurs only within the Mississippi River and the lower portion of some of its larger tributaries. The Project will not be located at the Mississippi River or any of its tributaries. Therefore, it was determined that the Project will have no effect on the Higgins eye pearly mussel or its habitats.

The prairie bush-clover is listed as threatened and occurs within native dry mesic-prairies where the soils are well-drained with high sand or gravel content. The Project area is confined to an area that is surrounded by a very large wetland complex where only poorly-drained soils exist (*see* **Section 6.5.3**). Therefore, it has been determined the Project will have no effect on the prairie bush-clover or its habitat.

Xcel Energy submitted a letter to the USFWS on March 17, 2011 describing the above determinations. On April 8, 2011 the USFWS responded via email concurring with the Company's determination that the Project will not impact federally listed species (*see* Appendix C.2). In its correspondence, the USFWS also indicated that a bald eagle nest may occur within the project area near the outlet of the Minnesota River and Black Dog Lake. On April 29, 2011 Xcel Energy representatives confirmed the location of the bald eagle nest and verified its active status.

Mitigative Measures

On June 20, 2011, Xcel Energy met with USFWS staff to discuss how to best route the transmission line in the area near the bald eagle nest. USFWS staff suggested angling a short segment of the transmission line away from the nest, placing structures along the shoreline or potentially within Black Dog Lake. Xcel Energy has since incorporated this recommendation into the Proposed Route by deviating from Black Dog Road between structrues 12 through 16 to avoid the nest (see **Figure 2** in Section 1.0).

6.6.2 State of Minnesota

A request for a MnDNR Natural Heritage Information System ("NHIS") search and comments regarding rare species and natural communities for the Project area was submitted to the MnDNR on March 11, 2011. The MnDNR responded in a letter dated May 25, 2011 (MnDNR, 2011e) (see Appendix C.2). The results of the MnDNR Natural Heritage Database Search are included on **Figure B-13**. The following assessment is based on the MnDNR response letter, a review of the Natural Heritage Database specific to Dakota County that is licensed to Xcel Energy by the MnDNR, and other state and federal rare species and natural community information.

The MnDNR NHIS database was queried to obtain the locations of rare and unique natural resources within the Project area. Queries to the NHIS database often display species that either do not have a legal status or are of special concern. Species or communities that do not have a status, or are classified as special concern, have no legal protection in Minnesota. Only potential impacts on species with legal protection (threatened and endangered) are discussed below.

Xcel Energy's review of the NHIS database identified one state-listed species within the Project area and the MnDNR identified two additional species and native plant communities in the area (MnDNR, 2011e). The species identified by the Xcel Energy's database search included the paddlefish (*Polyodon spathula*). The MnDNR identified the state-listed threatened Blanding's turtle (*Emydoidea blandingii*) and peregrine falcon (*Falco peregrinus*), and a seepage meadow/carr native plant community.

The MnDNR also identified the designated calcareous fens in the area and stated that they should be considered avoidance areas (see Alternatives discussion in Section 4.3). The MnDNR also stated the Proposed Route will avoid the fens (*see* Appendix C.2).

Mitigative Measures

To mitigate potential impacts on species occupying wetland communities, structures and poles will be placed so that the conductor spans waterbodies, watercourses, and wetlands to the extent possible. Sediment will be controlled so that it does not reach aquatic and wetland habitats.

Regarding the state-listed peregrine falcon, the species is known to have regularly nested on a smokestack at the existing Black Dog Plant since 1993. The MnDNR stated that it is unlikely that the transmission line construction as proposed would affect this species (MnDNR, 2011e). However, as recommended by the MnDNR, Xcel Energy will report any signs of unusual behavior or distress during construction of the proposed Project to the regional wildlife specialist.

Separate from the proposed Project, Xcel Energy had filed applications for new facilities to support the Black Dog Plant, Black Dog Repower Project, Docket No. E002/CN-11-184 (Certificate of Need) and E002/GS-11-307 (Site Permit). The Company has filed a petition with the Commission to withdraw the applications.

To prevent impacts on the Blanding's turtle associated with the Project, to the extent possible and applicable, Xcel Energy intends to adopt the mitigation measures recommended by the MnDNR, which include, but are not limited to, the following:

- a flyer with an illustration of a Blanding's turtle will be given to all contractors working in the area;
- turtles which are in imminent danger will be moved, by hand, out of harm's way. Turtles which are not in imminent danger will be left undisturbed;
- if a Blanding's turtle nest is in a yard, it will not be disturbed. Silt fencing will be set up to keep turtles out of construction areas. Silt fencing will be removed after the area has been revegetated;
- small, vegetated temporary wetlands (Types 2 & 3) will not be dredged, deepened, filled, or converted to storm water retention basins (these wetlands provide important habitat during spring and summer);
- wetlands will be protected from pollution; use of fertilizers and pesticides will be avoided, and run-off from lawns and streets will be controlled. Erosion will be prevented to keep sediment from reaching wetlands and lakes; and
- vegetation management in infrequently mowed areas, such as in ditches, along utility access roads, and under power lines, will be done mechanically (chemicals will not be used). Work will occur fall through spring (after October 1st and before June 1st).

Although not classified as protected by the state, Xcel Energy is also working with the MnDNR to avoid to the extent possible impacts on the Site of Moderate Biodiversity Significance associated with the seepage meadow/carr Native Plant Community, identified in the Project location. Mitigation measures may include the following:

- operate within already-disturbed areas;
- minimize vehicular disturbance in the area (allow only vehicles necessary for installation);
- inspect and clean all equipment prior to bringing it to the site to prevent the introduction and spread of exotic species;
- if possible, do work in autumn or winter, to avoid damaging plants during the growing season;
- reduce runoff by completing the work as rapidly as possible and using erosion control measures such as straw bales or silt fencing;
- revegetate disturbed soil with native species suitable to the local habitat as soon after construction as possible; and
- use only invasive-free mulches, topsoil, and seed mixes.

Xcel Energy will continue to coordinate with the MnDNR to ensure adverse impacts on rare and unique species will be avoided and mitigated when necessary.

6.7 Comparison of the Proposed Route and the Rejected Alternative Segment

Table 16 summarizes Xcel Energy's application of the factors set forth in Minnesota Rule 7850.4100 for the east end of the Project including the Proposed Route and the rejected route segment alternative. The table also includes information regarding permitability by other agencies.

Table 16 – Summary of Proposed and Alternative Route Segment East of I-35W[1]

Factor	Proposed Route	Alternative Route Segment	Comparison of Routes
Effects on the Natural Environment			
Public Waters	The Proposed Route spans approximately 1,995 feet of Black Dog Lake.	The Alternative Route Segment approximately 2,075 feet of Black Dog Lake.	The Alternative Route Segment crosses more public waters than the Proposed Route.
Wetlands	The Proposed Route spans 2.6 miles of wetland, including 0.4-mile of high-quality wetland.	The Alternative Route Segment spans 2.6 miles of high-quality wetland and five designated units of calcareous fen.	In comparison to the Proposed Route, the Alternative Route Segment would cause a greater impact on high-quality wetland crossings.
Flora	The Proposed Route spans approximately 2,066 feet of seepage meadow/carr native plant community.	The Alternative Route Segment spans 6,800 feet of seepage meadow/carr native plant community, 1,856 of bulrush marsh, 1,600 feet of mesic prairie, and 1,050 feet of calcareous fen.	The Alternative Route Segment has the greatest impact on flora, including seepage meadow/carr plant community, bulrush marsh, mesic prairie, and calcareous fens.
Fauna	No impact.	No impact.	Similar impact – none.
Rare and Unique Natural Resources	An active bald eagle nest is present near the Proposed Route and Xcel Energy is working closely with the USFWS to mitigate impacts. The Proposed Route is not likely to adversely impact the Blanding's turtle and peregrine falcon.	The Alternative Route Segment crosses wetland complexes that contain five state-listed calcareous fens, seepage meadow/carr native plant community, bulrush marsh, and mesic prairie. This alternative will not likely adversely impact the Blanding's turtle and peregrine falcon.	The Alternative Route Segment would cause significantly greater impacts on Rare and Unique Natural Resources in comparison with the Proposed Route.
Floodplains	The Proposed Route is located within a FEMA-designated 100-year floodplain. Flood maps indicate the Proposed Route is located in an area that only rarely to occasionally floods. Placing concrete structures within the Minnesota River floodplain would have a negligible effect on flooding potential.	The Alternative Route Segment is located within a FEMA-designated 100-year floodplain. Flood maps indicate the Proposed Route is located in an area that only rarely to occasionally floods. Placing concrete structures within the Minnesota River floodplain would have a negligible effect on flooding potential.	Similar impact – none.
Air Quality	No impact	No impact	Similar impact – none
Water Quality	No impact	No impact	Similar impact – none
Use of Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-of-Way			
Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-of-Way	The Proposed Route falls within or adjacent to existing road rights-of-way for approximately 1.3 miles, or 50 percent of route. The Proposed Route will require approximately 1.4 miles of new right-of-way.	The Alternative Route Segment would require approximately 0.6-mile of new greenfield right-of-way	Although the Proposed Route will use a greater percentage of new right-of-way, the Alternative Route Segment will utilize collocated right-of-way that crosses high-quality wetlands.

[1] This table only includes comparison data for the portion of the project east of I-35W.

Factor	Proposed Route	Alternative Route Segment	Comparison of Routes
Cost of Constructing, Operating, and Maintaining the Facility That are Dependent on Design and Route			
Construction/ Constructability	The competent mineral soils present along the Proposed Route would help to facilitate construction. Much of the route is directly accessible from existing infrastructure (e.g., Black Dog Road).	The Alternative Route Segment is dominated by fairly thick peat soils, which poses significant challenges and increased cost to construction. Furthermore, no existing road infrastructure exists, which would require the use of temporary access roads along the entire route, with the exception of the portion of the alignment located within Black Dog Lake.	The Alternative Route Segment would be significantly more difficult and costly to construct in comparison with the Proposed Route.
Maintenance (future)	Existing development and infrastructure offer the best accessibility for maintenance activities along the Proposed Route.	The Alternative Route Segment crosses extensive high-quality wetlands, five units of designated calcareous fen, and predominantly thick peat soils, greatly complicating accessibility for future maintenance activities.	The Alternative Route Segment would be more difficult and costly to perform future maintenance activities in comparison with the Proposed Route.
Costs	$5.96 million for construction.	$6.3 million for construction.	The Alternative Route Segment is estimated to be more costly to construct in comparison to the Proposed Route due to factors identified above.
Effects on Human Settlement			
Structures within 200 feet of the route centerline	Only the Black Dog Substation is located within 200 feet of the Proposed Route centerline - no impact.	Only the Black Dog Substation is located within 200 feet of the Alternative Route Segment centerline - no impact.	Similar impact – none.
Displacement	No impact.	No impact.	Similar impact – none.
Noise	No impact.	No impact.	Similar impact – none.
Aesthetics	The Proposed Route would result in the removal of structures and lines across the middle of Black Dog Lake. The Proposed Route would result in viewshed impacts along Black Dog Road and the proposed bike path for approximately 1.8 miles.	The Alternative Route Segment would result in adding a new transmission line and structures adjacent to an existing double circuit 345 kV line and single circuit 115 kV line, thereby increasing line proliferation in the area. Structures and lines would be removed from the middle of Black Dog Lake.	The Proposed Route would have slightly greater impact to aesthetics than the Alternative Route Segment.
Cultural Values	No impact.	No impact.	Similar impact – none.
Recreation	The Proposed Route may result in minor impacts during construction to three recreational areas located near the Project: the Minnesota Valley NWR, Cliff Fen Park, and Black Dog Park. The City of Burnsville is also planning for a potential bike trail to be constructed along Black Dog Road. The Proposed Route would result in negligible impacts on the recreational value of the proposed bike trail.	The Alternative Route Segment may result in minor impacts during construction to three recreational areas located near the Project: the Minnesota Valley NWR, Cliff Fen Park, and Black Dog Park.	Similar impact – minor impacts during construction to three recreational areas located near the Project.

Factor	Proposed Route	Alternative Route Segment	Comparison of Routes
Public Services	No impact.	No impact.	Similar impact – none.
Effects on Public Health and Safety			
Public Health and Safety	No impact from noise or EMF.	No impact from noise or EMF.	Similar impact – none.
Effects on Land-based Economics			
Agriculture	No impact.	No impact.	Similar impact – none.
Forestry	No impact.	No impact.	Similar impact – none.
Tourism	A short-term impact on tourism may result during construction along the Proposed Route within Minnesota Valley NWR. However, after construction activities are complete, it is unlikely that tourism activities will be increased or decreased as a result of the Project.	A short-term impact on tourism may result during construction along the Alternative Route Segment within Minnesota Valley NWR. However, after construction activities are complete, it is unlikely that tourism activities will be increased or decreased as a result of the Project.	Similar impact – short-term impact may result during construction.
Mining	No impact on mining operations east of I-35W.	No impact to mining operations east of I-35W.	Similar impact east of I-35W – none.
Effects on Archaeological and Historic Resources			
Archaeological Resources	Three archaeological sites are located within one mile of the Proposed Route. The Proposed Route would result in no impact to these sites.	One archaeological site is located within one mile of the Alternative Route Segment. The Alternative Route Segment would result in no impact to this site.	Similar impact – none.
Historic Resources	One historic architectural property (Union Pacific Railroad) is located within one mile of the Proposed Route.	One historic architectural property (Union Pacific Railroad) is located within one mile of the Alternative Route Segment.	Similar impact – none.
Permitability			
	As discussed in Sections 6.5 and 7.0, there does not appear to be significant permitting issues with federal, state, and local agencies that would inhibit the permitability of the Proposed Route.	Fens are regulated by MnDNR and Calcareous Fen Management Plan required if crossing were allowed.	The Alternative Route Segment has significant permitting requirements that may not be possible to satisfy under current state regulations.
Electrical System Reliability			
Electrical System Reliability	The proposed Project provides additional reliability to system.	The proposed Project provides additional reliability to system.	Similar benefits.
Adverse Human and Natural Environmental Effects That Cannot Be Avoided			
General	Structure placement along the Proposed Route would potentially result in wetland impacts and tree removal.	Structure placement along the Alternative Route Segment would potentially result in wetland impacts and tree removal.	Similar impacts.
Irreversible and Irretrievable Commitments of Resources			

Factor	Proposed Route	Alternative Route Segment	Comparison of Routes
General	Structure placement along the Proposed Route would potentially result in wetland impacts and tree removal.	Structure placement along the Alternative Route Segment would potentially result in wetland impacts and tree removal.	Similar impacts.

7.0 AGENCY INVOLVEMENT, PUBLIC PARTICIPATION, AND REQUIRED PERMITS AND APPROVALS

7.1 Agency Contacts

7.1.1 Notice to Agencies, Local Government Units, and Interested Parties

Xcel Energy has notified applicable federal and state regulatory agencies, local government units, and interested parties of the proposed Project. Xcel Energy also held an interagency meeting on June 2, 2011 with the following parties to discuss the project. Participating parties included: USACE, USFWS, MnDNR, City of Burnsville, and Dakota County.

7.1.2 USACE

Xcel Energy met with the USACE St. Paul District on two occasions to discuss the Project. The first meeting was held as part of the interagency meeting on June 2, 2011 that included the USACE, USFWS, MnDNR, City of Burnsville, and Dakota County. The second meeting occurred between Xcel and the USACE only on July 22, 2011 to discuss the project in further detail as it pertains to regulation under Section 404 of the Clean Water Act. Xcel Energy is currently preparing the Minnesota Local/State/Federal Application Form to Water/Wetland Projects, concurrently with the preparation of the Route Permit application, for submittal to the USACE, MnDNR, and City of Burnsville. In June 2011, a wetland delineation was performed along the Proposed Route east of I-35W that will be included with the Minnesota Local/State/Federal Application Form to Water/Wetland Projects.

In the early coordination with the USACE it was confirmed that project impacts to aquatic resources will be federally regulated. Because the Project will involve construction in the vicinity of state-designated components of the Black Dog Calcareous Fen, Regional General Permit RGP-03-MN would not likely apply (Condition 3, Activities Specifically Excluded from RGP-03-MN); therefore, it appears USACE approval will be obtained under the St. Paul District's Letter of Permission procedures (LOP-05-MN). Xcel Energy will continue to work closely with the USACE simultaneously to the MPUC Route Permit process.

7.1.3 United States Fish and Wildlife Service

On March 17, 2011, Xcel Energy submitted a consultation letter to the USFWS requesting review and concurrence that the Project will not affect federally species and critical habitat that may be present within Dakota County. On April 8, 2011 the USFWS responded via email concurring that the Project will not impact federally listed species. As described in Section 6.6.1, the USFWS also indicated in its response that a bald eagle nest may occur in the vicinity of the project area near the outlet of the Minnesota River and Black Dog Lake. On April 29, 2011 Xcel Energy representatives confirmed the location of the bald eagle nest and verified its active status. Xcel Energy met with USFWS staff onsite on June 7, 2011 to discuss how to avoid Project-related impacts to the active bald eagle nest. USFWS staff recommended that Xcel Energy route the transmission line along the shoreline within Black Dog Lake, angling away from the nest. This route adjustment recommendation has since been incorporated into the Proposed Route (*see* **Figure 2** and **Appendix B**). Xcel Energy will continue to work with the

USFWS to determine whether additional mitigative measures should be implemented as part of this Project.

7.1.4 Minnesota Department of Transportation

Xcel Energy sent a letter to MnDOT advising it of the Project and seeking input on April 6, 2011. At that time, the anticipated alignment was approximately 230 feet north of the existing crossing of Interstate 35. The Company followed up with MnDOT with a letter on September 12, 2011 advising that the proposed alignment for the double circuit, single pole design was at the existing crossing. MnDOT did not state any concern about the crossing, but noted that any parallel alignment would not be permitted to permanently encroach on highway right-of-way.

7.1.5 Minnesota Department of Natural Resources

Xcel Energy submitted a formal review request to the MnDNR. The letter was sent on March 11, 2011 and requested a review of the Minnesota NHIS to determine if rare plants, animals, and natural communities or other significant natural features are known to occur within the Project location (*see* also Section 6.6.2 above and **Appendix C.2**).

In its May 25, 2011 NHIS response, the MnDNR identified rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed Project as discussed in Section 6.6.2. Xcel Energy is currently working with the MnDNR to determine appropriate and applicable mitigation measures for the Project (*see* Section 6.6).

7.1.6 Minnesota State Historic Preservation Office

On March 18, 2011, Xcel Energy submitted a consultation letter to the Minnesota SHPO requesting SHPO written agreement with a Phase Ia literature review report findings for the Project, which recommended that no archaeological or historic resources will be affected by the proposed Project.

As discussed in Section 6.4, the Minnesota SHPO commented on the proposed Project and Phase Ia literature review report in a letter dated April 20, 2011. The Minnesota SHPO stated that it concludes that there are no properties listed in the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by the project.

7.1.7 City of Burnsville and Dakota County

The Company met with Burnsville officials on April 20, 2011 and with Dakota County officials on June 7, 2011 to discuss the Project.

7.2 Identification of Landowners

There are 17 adjacent and affected property owners to the Proposed Route as listed in **Appendix D**. Xcel Energy has notified and is currently coordinating with all landowners.

7.3 Required Permits and Approvals

The following **Table 17** identifies federal, state, and local permits and approvals that could potentially be required for the Project.

Table 17 – Potential Required Permits

Jurisdiction and Permit	Requirement
Federal	
USACE, Clean Water Act, Section 404 Permit	Required if dredging and filling activities will occur within jurisdictional wetlands. If the proposed activities are not eligible for coverage under the General Permit or Letter of Permission, an Individual Permit will be obtained from the USACE.
State	
MPUC, Route Permit	Required for any high voltage transmission line.
MnDNR, License to Cross Public Waters and Public Waters Work Permit	Required if any work is necessary in public waters.
MnDOT, Utility Permit	Required to place utilities on or across Minnesota trunk highway right-of-way.
MPCA, NPDES/SDS General Stormwater Permit for Construction Activity	Required under the NPDES/SDS General Stormwater Permit for Construction Activity where construction activities will cause more than one acre of ground disturbance.
MPCA, Section 401 Water Quality Certification	Required if the USACE requires an individual permit for wetland dredging and filling activities, this certification is required.
Local	
Moving Permit (Hauling)	Required whenever legal dimensions and/or axle weights are exceeded per county regulations.
Oversize/Overweight Vehicle Permit	Required on all county highways. May be required to move over-width loads on county, township, or city roads.

For the other permits listed in **Table 17** above, and any additional permit requirements identified during subsequent agency consultations, Xcel Energy will acquire the necessary authorizations and develop the appropriate plans associated with any permit or authorization prior to construction.

8.0 REFERENCES

Black Dog Watershed Management Organization. 2011. Welcome to the Black Dog Watershed Management Organization. Available online at http://www.blackdogwmo.org/introduction.html. Accessed January 2011.

City Burnsville, 1994, Edward Kraemer and Sons, Inc. Planned Unit Development for Landfill, Quarry, and Wetland/Nature Center. City of Burnsville, Minnesota.

City of Burnsville. 2010. 2030 Comprehensive Plan Update, Adopted June 22, 2010, Chapter VI-Natural Environment Plan. Available online at http://www.ci.burnsville.mn.us/DocumentView.aspx?DID=1849. Accessed July 2011.

City of Burnsville. 2011b. Black Dog Park. Available online at http://www.ci.burnsville.mn.us/index.aspx?NID=269. Accessed September 2011.

City of Burnsville. 2011c. Cliff Fen Park. Available online at http://www.burnsville.org/facilities.aspx?pagenum=3&RID=8&Page=detail. Accessed September 2011.

Dakota County Maps and Mapping Services. 1990. Geologic Atlas. Available online at http://www.co.dakota.mn.us/DoingBusiness/MapsAndServices/Download/GeologicAtlas1.htm. Accessed December 2010.

ePodunk. 2010a. Dakota County, Minnesota. Ancestry and Family History. Available online at http://www.epodunk.com/cgi-bin/genealogyInfo.php?locIndex=20971. Accessed December 2010.

ePodunk. 2010b. Dakota County, Minnesota. Business Info. Available online at http://www.epodunk.com/cgi-bin/bizData.php?locIndex=20971. Accessed December 2010.

Minnesota Department of Natural Resources. 2011a. Ecological Classification System. Available online at http://www.dnr.state.mn.us/ecs/index.html. Accessed January 2011.

Minnesota Department of Natural Resources. 2011b. Minnesota and Northeast Iowa Morainal Section. Available online at http://www.dnr.state.mn.us/ecs/222M/index.html. Accessed January 2011.

Minnesota Department of Natural Resources. 2011c. Watershed Assessment Tool. Available online at http://www.dnr.state.mn.us./watershed_tool/index.html. Accessed September 2011.

Minnesota Department of Natural Resources. 2011d. Floodplain Management and Flooding, History. Available online at http://www.dnr.state.mn.us./waters/watermgmt_section/floodplain/history.html. Accessed September 2011.

Minnesota Department of Natural Resources. 2011e. Letter dated May 25, from L. Joyal (Natural Heritage Review Coordinator) to T. Janssen (Merjent, Inc.).

Minnesota Department of Transportation. 2001. General Highway Map; Dakota County, Minnesota. Available online at http://www.dot.state.mn.us/materials/maps/copitmaps/dakota.pdf. Accessed December 2010.

Minnesota Department of Transportation. 2009. Traffic Volumes. Available online at http://www.dot.state.mn.us/traffic/data/html/volumes.html. Accessed January 2011.

Minnesota Federation of County Fairs. 2010. Dakota County Fair (Farmington). Available online at http://mfcf.com/members.htm#D. Accessed December 2010.

U.S. Census Bureau. 2010a. U.S. Census, Resident Population Data, Population Density. Available online at http://2010.census.gov/2010census/data/apportionment-dens-text.php. Accessed December 2010.

U.S. Census Bureau. 2010b. State and County QuickFacts. Minnesota. Available online at http://quickfacts.census.gov/qfd/states/27000.html. Accessed December 2010.

U.S. Census Bureau. 2010c. State and County QuickFacts. Dakota County, Minnesota. Available online at http://quickfacts.census.gov/qfd/states/27/27037.html. Accessed December 2010.

U.S. Census Bureau. 2010d. State and County QuickFacts. City of Burnsville. Available online at http://quickfacts.census.gov/qfd/states/27/2708794.html. Accessed December 2010.

U.S. Census Bureau. 2010e. Population Finder. Burnsville City, Minnesota. Available online at http://factfinder.census.gov/servlet/SAFFPopulation?_event=Search&geo_id=05000US27037&_geoContext=01000US%7C04000US27%7C05000US27037&_street=&_county=Burnsville&_cityTown=Burnsville&_state=04000US27&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=050&_submenuId=population_0&ds_name=null&_ci_nbr=null&qr_name=null&reg=null%3Anull&_keyword=&_industry=. Accessed December 2010.

U.S. Census Bureau. 2010f. Population Finder. Eagan City, Minnesota. Available online at http://factfinder.census.gov/servlet/SAFFPopulation?_event=Search&geo_id=16000US2708794&_geoContext=01000US%7C04000US27%7C16000US2708794&_street=&_county=Eagan&_cityTown=Eagan&_state=04000US27&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=population_0&ds_name=null&_ci_nbr=null&qr_name=null&reg=null%3Anull&_keyword=&_industry=. Accessed December 2010.

U.S. Census Bureau. 2010g. State and County QuickFacts. City of Eagan. Available online at http://quickfacts.census.gov/qfd/states/27/2717288.html. Accessed December 2010.

U.S. Department of Agriculture, Natural Resources Conservation Service – Soil Data Mart. Soil Survey Geographic (SSURGO) Database. Available online at http://soildatamart.nrcs.usda.gov/. Accessed June 2011.

U.S. Environmental Protection Agency. 2011. Counties Designated "Nonattainment." Available online at http://epa.gov/airquality/greenbk/mapnpoll.html. Accessed July 2011.

U.S. Fish and Wildlife Service. 2011a. Minnesota Valley NWR and WMD. Available online at http://www.fws.gov/Midwest/MinnesotaValley/intro.html. Accessed January 2011.

U.S. Fish and Wildlife Service. 2011b. Endangered Species in Minnesota. Available online at http://www.fws.gov/midwest/endangered/lists/minnesot-cty.html. Accessed January 2011.

Wildlife Viewing Areas. 2011. Minnesota Valley NWR /IBA. Available online at http://www.wildlifeviewingareas.com/wv-app/ParkDetail.aspx?Park ID=537. Accessed December 2011.

9.0 DEFINITIONS

Following are a list of definitions for technical terms used in this Application:

Avian	Of or relating to birds.
Breaker	Device for opening a circuit.
Bus	An electrical conductor that serves as a common connection for two or more electrical circuits; may be in the form of rigid bars or stranded conductors or cables.
Conductor	A material or object that permits an electric current to flow easily.
Corona	The breakdown or ionization of air in a few centimeters or less immediately surrounding conductors.
Double circuit	The construction of two separate circuits at the same or different voltage on the same structures to increase capacity of the line.
Electric Field ("EF")	The field of force that is produced as a result of a voltage charge on a conductor or antenna.
Electromagnetic	The term describing the relationship between electricity and magnetism; a quality that combines both magnetic and electric properties.
Electromagnetic Field ("EMF")	The combination of an electric (E) field and a magnetic (H) field, such as in high frequency radiating fields. For the lower frequencies associated with power lines, EMF should be separated into electric and magnetic fields. Electric and magnetic fields arise from the flow of electricity and the voltage of a line. The intensity of the electric field is related to the voltage of the line. The intensity of the magnetic field is related to the current flow through the conductors.
Electromotive Force	The force (voltage) that produces an electric current in a circuit.
Excavation	A cavity formed by cutting, digging, or scooping.
Fauna	The collective animals of any place or time that live in mutual association.
Flora	The collective plants of any place or time that live in mutual association.
Grading	To level off to a smooth horizontal or sloping surface.
Grounding	To connect electrically with a ground; to connect some point of an electrical circuit or some item of electrical equipment to earth or to the conducting medium used in lieu thereof.

Habitat	The place or environment where a plant or animal naturally or normally lives and grows.
High Voltage Transmission Lines ("HVTL")	Overhead and underground conducting lines of either copper or aluminum used to transmit electric power over relatively long distances, usually from a central generating station to main substations. They are also used for electric power transmission from one central station to another for load sharing. In Minnesota, a HVTL is a conductor of electric energy and associated facilities designed for and capable of operating at a nominal voltage of 100 kilovolts or more either immediately or without significant modification (associated facilities include, but not be limited to, insulators, towers, substations, and terminals). *See* Minn. R. 7850.1000, Subp. 9.
Ionization	Removal of an electron from an atom or molecule. The process of producing ions. The electrically charged particles produced by high-energy radiation, such as light or ultraviolet rays, or by the collision of particles during thermal agitation.
Magnetic Field ("MF")	The region in which the magnetic forces created by a permanent magnet or by a current-carrying conductor or coil can be detected. The field that is produced when current flows through a conductor or antenna.
Mitigate	To lessen the severity of or alleviate the effects of.
Neutral to Earth Voltage ("NEV")	The term NEV is used to describe a measurable level of voltage which may occur between a metal object and the adjacent floor or earth.
Oxide	A compound of oxygen with one other more positive element or radical.
Ozone	A form of oxygen in which the molecule is made of three atoms instead of the usual two.
Raptor	A member of the order Falconiformes, which contains the diurnal birds of prey, such as the hawks, harriers, eagles, and falcons.
Sediment	Material deposited by water, wind, or glaciers.
Stray Voltage	A condition that can occur on the electric service entrances to structures from distribution lines, not transmission lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings such as barns. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. Transmission lines, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line.

Substation	A substation is a high voltage electric system facility. It is used to switch generators, equipment, and circuits or lines in and out of a system. It also is used to change AC voltages from one level to another. Some substations are small with little more than a transformer and associated switches. Others are very large with several transformers and dozens of switches and other equipment.
Ultraviolet Radiation	A portion of the electromagnetic spectrum with wavelengths shorter than visible light.
Voltage	Electric potential or potential difference expressed in volts. A unit of electrical pressure, electric potential or potential difference expressed in volts. The term used to signify electrical pressure. Voltage is a force that causes current to flow through an electrical conductor. The voltage of a circuit is the greatest effective difference of potential between any two conductors of the circuit.
Voltage Drop	The difference in voltage between two points; it is the result of the loss of electrical pressure as a current flows through a resistance.
Waterfowl	A bird that frequents water; especially a swimming game bird (as a duck or goose) as distinguished from an upland game bird or shorebird.
Wetland	Wetlands are areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil. Wetlands include swamps, marshes, bogs and similar areas.

10.0 ACRONYMS

AADT	Annual Average Daily Traffic
ACSR	Aluminum Conductor Steel Reinforced
ACSS	Aluminum Conductor Steel Supported
APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
BDWMO	Black Dog Watershed Management Organization
BMPs	Best Management Practices
Company	Northern States Power Company
dBA	decibels
ECS	Ecological Classification System
EF	electric fields
ELF	extremely low frequency
EMF	electromagnetic fields
FEMA	Federal Emergency Management Agency
HVTL	high voltage transmission line
I-35W	Interstate 35W
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEEE	Institute of Electrical and Electronic Engineers
KCmil	thousand circular mil
kV	kilovolt
kV/m	kilovolts per meter
LEF	large energy facility
LGU	local government units
LOP	Letter of Permission
MCBS	Minnesota County Biological Survey
MF	magnetic field
mG	milliGauss
MnDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MOU	Memorandum of Agreement
MPCA	Minnesota Pollution Control Agency

MPUC or Commission	Minnesota Public Utilities Commission
NAC	Noise Area Classification
NERC	North American Electric Reliability Corporation
NESC	National Electric Safety Code
NEV	Neutral to Earth Voltage
NHIS	Nature Heritage Information System
NIEHS	National Institute of Environmental Health Sciences
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
PEM	Palustrine Emergent wetland
PFO	Palustrine Forested wetland
ppm	parts per million
PPSA	Power Plant Siting Act
Project	Rebuild of Transmission Lines 0844 and 0861 Project
PSCW	Public Service Commission of Wisconsin
PSS	Palustrine Shrub-Scrub wetland
PUBF	Palustrine Unconsolidated Bottom wetland
PWI	public waters inventory
SFD	swan flight diverters
SHPO	State Historic Preservation Office
SWCD	Soil and Water Conservation District
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WCA	Minnesota Wetland Conservation Act
WHO	World Health Organization
Xcel Energy	Northern States Power Company

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